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THE UNIVERSITY OF ALBERTA

AN APPLICATION OF SPRITE TO TELECOMMUNICATIONS FUTURES FORECASTING

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

AND RESEARCH IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF BUSINESS ADMINISTRATION

EDMONTON, ALBERTA

FALL, 1980

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "An Application of S.P.R.I.T.E. to Telecommunications Futures Forecasting" submitted by Walter William Horbay in partial fulfillment of the requirements for the degree of Master of Business Administration.

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Date October 10, 1980

ABSTRACT

This study examined the application of futures forecasting to the business planning environment. An exploratory effort in ascertaining the future state of the telecommunications environment in Alberta with special attention being paid AGT was undertaken. It was intended that the study address the identification and assessment of those future development which were identified as impacting the defined environment. The study did not propose the development of an exhaustive examination of the subject area, but rather strove to provide both input and assessment of the existing planning process.

The forecasting methodology employed was a modified version of the SPRITE (Sequential Polling and Review of Interacting Teams of Experts) technique; an offshoot of the Delphi technique. The selected technique stressed subject exploration as opposed to development of a concensus as in the case of the Delphi, and involved extensive use of comments provided by the two groups of participants in both the execution and analysis.

The major conclusions of the study included:

1. The development of a series of predictions regarding the defined subject matter and an analysis of differences between groups regarding

these predictions.

2. It was ascertained that the modified SPRITE technique was well suited to application in the area of business planning.

3. The diagnostic capabilities available via application of the technique were very valuable in the context of the corporate planning environment, and deserving of further examination via research.

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CHAPTER I

INTRODUCTION

TOPIC OF STUDY

The topic of study centered upon the development of a series of forecasts for input into the strategic planning function of Alberta Government Telephones. This input took the form of delineation and assessment of factors which were determined to bear influence upon organization up to and including the year 2000 A.D.. The SPRITE (Sequential Polling and Review of Interacting Teams of Experts) futures forecasting technique was employed as the methodology for addressing this topic.

PROBLEM STATEMENT

Within Alberta Government Telephones there existed no evidence to suggest the presence of unity in corporate direction regarding the future of the corporation. More succinctly, strategic planning in the formal context was not present. This lack of clearly defined direction for the future placed the corporation in an undesirable position relative to future planning, and further inattention to this issue was untenable. This study represented an initial step in the implementation of

a methodology for the development of input to the strategic planning function and a more rigorous assessment of the status of this function as it may have existed. Drucker, though addressing only the technological component, emphasized the importance of this function in the business environment in the following exerpt.

> "First of all, the businessman will have to learn to understand the dynamics of technology and anticipate the direction and speed of technological change...If...a growing developed economy is to be capable of rapid innovation and change, its businessmen must be able to anticipate technology and to take advantage of the opportunity that technological development offers".[1]

Continuing from the above, Elias suggested that an effective option for initiating the strategic planning process may have been established through employment of the following rather simplified futures forecasting technique.

> "...Asking managers individually, or in groups, to look ahead and pick out the five most important opportunities and the five most important threats which they see for their company."[2]

In summary, there was noted to exist a lack of rigor in both the execution of the strategic planning function in the organization and in the evaluation of this process. The specific components of the problem

were determined to exist as outlined below:

i. There existed a high level of uncertainty relative to which forces, be they interpretted as opportunities or threats, which may influence the future of the telecommunications environment in Alberta.

ii. There was no evidence to suggest the existence of any systematic or planned efforts aimed at addressing the afore outlined issue.

iii. Differing managerial groups within the company, and specifically within the Corporate Development Department, hold significantly differing perceptions of the future in certain key instances.

Though the study did not propose an exhaustive review of issues related to this topic, it was intended to provide a basis for initial research and exploration of the application of futures forecasting to the strategic planning function from the perspectives outlined. Additionally, it was proposed that the state of the planning process could be assessed to a certain degree employing this methodology.

RESEARCH QUESTIONS

In respect of the problem as outlined and the exploratory nature of the task, the research questions were delineated as follow:

i. Some of the factors which may bear influence upon the telecommunications environment in Alberta may be identified and assessed as to their nature, probability of occurrence and probable time of initial occurrence.

ii. The two managerial groups defined for the purposes of the study, upper (supervisory) and lower (non-supervisory) management personnel of AGT's Corporate Development Department hold dissimilar views of the subject matter, and these differences may be identified and partially explained.

DEFINITION OF FACTORS EMPLOYED

Future Environment

For purposes of the study, future environment was defined as that period of time spanning from late 1978 to and including the year 2000 A.D.. This environment was defined in the context of two major components; environmental opportunities and threats,

and corporate resources and competences. These two factors were determined to be the major components which interacted to create the framework for the strategic planning function within AGT. The combination and interaction of these factors will necessarily constitute the future environment in which Alberta Government Telephones will operate. It was also felt that defining this factor in such broad terms would allow for a flexible yet directive approach to the problem, enabling the execution of a systematic review and examination of the acquired data.

The following excerpt emphasized the necessity for approaching the subject in a comprehensive fashion. In Addition, this excerpt served to substantiate and advance the significance of the strategic planning process and function as forwarded by Drucker (see [2]).

> "As in other areas of management, one may expect that technological forecasting will advance towards a total systems concept. Clearly, views toward the future involve all facets of the firm and go beyond organizational boundaries. The systems approach may be expected to become the bedrock of effective forecasting. The systems concept will include both social needs and technical needs. Both technical and social needs will influence the technological format.[3]

The Organization

Alberta Government Telephones, a Crown Corporation created some seventy years ago, was established with a view to providing inter-exchange telephone service to the citizens of Alberta. With the exception of Edmonton Telephones, which serves the metropolitan Edmonton area, Alberta Government Telephones was the sole supplier of most telecommunication services in Alberta and certainly held the dominant position in this marketplace. Over the course of the last decade, growth in both consumer demand and technological advancement, has provided the organization with a high growth rate in both volume of business and the complexity of the operating environment in Alberta. Additional to this growth has been the advent of competitive forces which will no doubt influence the long term viability of AGT in many of its service areas.

The Management

A traditional pyramidal management system characterized Alberta Government Telephones organizational structure. An overview of the corporate structure and detailed overview of the Corporate Development Department structure appears in Appendix "A". Though the organization had undergone massive

changes in both size and complexity, the managerial structure remained fundamentally unchanged with the exception of the addition of several departments and the creation of profit centre type responsibility structuring in several areas.

Of the changes above mentioned, the creation of a Corporate Development department was most significant for the study. Recognition of the need for a more rigorous and systematic means of environmental scanning and planning was the prime contributing factor favoring this addition. However, while it was concluded that the department had not been utilized nor aligned with the organization as originally intended, its influence has continued to strengthen relative to the corporate planning function.

The nature of managerial personnel in this department was characterized by categorizing the majority of supervisory managers as being professional technically trained individuals with extensive telecommunications experience gained through five or more years association with the corporation. Conversely, with the exception of technical specialists, the non-supervisory management, responsible for the bulk of departmental output, tended to be of shorter tenure with the corporation, and often not trained in a technical discipline, but

rather in the business discipline. As such, there tended to exist a difference in ideology and expectations of the corporation in its current and currently envisioned future states.

JUSTIFICATION FOR THE STUDY

Although assessments of the future no doubt existed with individuals of the managerial group being discussed, there was no evidence to suggest the existence of a formal strategic planning function or a composite future assessment within Alberta Government Telephones. Consequently the purpose of the study was to prepare a series of forecasts on those future developments which may have an impact upon the telecommunications environment in Alberta, and the significance of these developments to Alberta Government Telephones. It was intended that the application of a futures forecasting study in the AGT Corporate Development Department would provide the means to attainment of the study objectives outlined in the following discussion.

The primary objective of the study was to develop a clearer understanding of the future forces and events which may bear influence upon the telecommunications environment in Alberta, be these forces political, social, economic or technological in

nature. This clearer understanding was essential if managers were to define future directions for the pursuit of corporate viability over the defined time period and beyond.

A second objective of the study was to determine what if any differences may have existed between the defined managerial groups as to their perceptions of the future of the telecommunications environment and the significance of such for Alberta Government Telephones. It was intended that an analysis of differences would provide a means for assessing the effectiveness of the existing planning efforts.

A third, but much less significant objective of the study was to evaluate the role of futures forecasting as a component of the planning function. This application had not previously been attempted in the defined study context, and it was felt that a successful exercise might help broaden the parameters of the planning processes employed within AGT.

It was proposed that an offshoot of the Delphi technique of futures forecasting be employed in the execution of this study. The SPRITE technique appeared well suited to the subject matter afore outlined and allowed address of the delineated study objectives. Previous research efforts in the area of

future assessment relative to the telecommunications environment tended to deal with well defined and fairly specialized subject matter[4,5,6], often of a technological nature, quite unlike the rather broad and general exploratory subject matter being considered in this study thereby rendering the study a unique effort in the defined subject area. The following section of the study shall deal with the scope and limitations affecting the proposed study.

SCOPE AND LIMITATIONS OF THE STUDY

Delineated below are possible weakness and limitations in which context this study was executed.

i. The study was designed to act as an exploratory work and was not intended to provide either an exhaustive examination of the subject area nor any information which could have been classed as being other than preliminary.

ii. The study was static in nature as it involved a cross-sectional examination of the future. As such, the validity of the proposed work will be ascertained over the time horizon being examined. Its eventual usefulness will be judged by its performance

rather than by any abstract analysis of worth.[7]

iii. Due to the highly specialized nature of the subject matter being reviewed, it was felt unlikely that much of the proposed study output would be found useful in any application save those previously outlined within Alberta Government Telephones.

iv. The somewhat limited selection of techniques applicable to the examination of the subject as defined allowed for little leeway in this matter. Certainly the selected technique was not without methodological fault, but it represented the most viable alternative applicable to the examination of the defined subject matter.

v. Any study employing opinions of a group of "experts" will suffer from weaknessess inherent to such information sources.

vi. Not unlike many other research efforts, the scope of the study was limited by availability of time, monetary resources and as outlined, methodological constraints. Additionally, the logistics factor associated with managing the large amounts of information often acquired in this type of

effort and the sensitive nature of the subject matter further limited the scope of the proposed study.

FOOTNOTES

[1] P.F. Drucker, The Age of Discontinuity. [New York: Harper & Row, 1969], p. 43-44.

[2] A. Blair and N.S. Elias, Management: Processes and Problems, [Hamilton: S.M.A., 1977], p. 4.8.

[3] Butler, Havesh and Platt ed., Methods and Techniques of Business Forecasting, [Englewood Cliffs N.J.: Prentice Hall, 1974], p. 237.

[4] M.T. Bedford, The Future of Communication Services in the Home, [M.B.A. Thesis. McGill University, 1972].

[5] D.Z. Goodwill, An Exploration of the Future of Information Processing Technology [Montreal: Bell Headquarters Planning, Bell Canada, (1971)].

[6] F.J. Doyle, D.Z. Goodwill, An Exploration of the Future in Medical Technology. [Montreal: Bell

Canada, (1975)].

[7] Y. Pill, "The Delphi Method: Substance/ Context; A Critique and an Annonated Bibiliography," Socio Economic Planning Sciences, Vol. 5, (1971): 64.

CHAPTER II

REVIEW OF LITERATURE

The purpose of the literature review was twofold. First, a discussion of techniques applicable to future forecasting was undertaken. Secondly, both the traditional DELPHI and SPRITE methodologies were reviewed, with the intention of identifying the strengths and shortcomings of the respective techniques and discussing the similarities and differences between the techniques with a view to developing the rationale for the selection of a suitable methodology for the proposed study.

DESCRIPTION OF AVAILABLE TECHNIQUES

In general, future assessments were determined to employ either quantitative or qualitative methodologies. In many areas of quantitative futures forecasting, assessments often took the form of historically based statistical projections. Frequently prescribed to techniques of this type included time-series analysis, projection based upon time independent trend comparison, trend extrapolation, trend fitting and causal models.[1] The key difficulty

common to techniques of this type was that they invariably tended to rely upon quantitative historical data; data assumed to be meaningful in the context of future assessment. Further, in many subject areas, especially in the area of strategic planning, relevant historical data is not readily available, and if available, often inapplicable to the case at hand. For these reasons, quantitative forecasting techniques employing historical data have proven useful only in a narrow context of future assessment and are often suitable for only short-term (1-5 year) forecasting horizons.[2]

The difficulties and limitations associated with the employment of the afore described quantitatative techniques appear as follow:

i. In a world of dynamically changing technological and micro-economic contexts, it appears that the future may vary significantly from the past, thereby undermining the validity of extrapolations of historically based data.

ii. Projections based on historical observation appeared much more applicable to the assessment of a micro-economic situation rather than to the macro system. Individual component (micro-economic) variations within the larger

system appeared to have a lower overall system effect as a result of balancing effect among micro-components.[3]

Qualitative techniques on the other hand, were found not to necessarily have been heavily reliant upon historical data nor upon sophisticated statistical extrapolation of observed trends into the future. Methodologies employing the qualitative approach appeared well suited to situations characterized by data scarcity and medium to long term time horizons. The applicability of such techniques was therefore readily discerned in areas of study involving a dynamic set of environmental factors and a lack of readily available quantitative data; very much akin to the situation forming the study context.

A qualitative methodology was determined most suitable for the study in view of the parameters earlier outlined. Specifically, an offshoot of the Delphi methodology, SPRITE, developed by M.T. Bedford of Bell Canada was selected. The following discussion presents an overview of the Delphi technique, the SPRITE technique and a comparative assessment of these methodologies.

THE DELPHI TECHNIQUE

The forecasting technique referred to as the Delphi was developed by the RAND Corporation in the early 1950's. The technique was employed mainly in the context of military armament requirements forecasting. It was not until the early 1960's that the technique was declassified and not until almost a decade later that it gained some degree of acceptance in the industrial community.[4] The Delphi technique represented a means for dealing with futures forecasting in a manner superior to that available with then exsiting methodological alternatives. The following excerpt provided insight as to the contribution made to forecasting via the Delphi technique over and above the scope of traditional forecasting methodologies.

> "There are two options available when one is working on a problem under conditions of uncertainty with insufficient data, incomplete theory and a high order of complexity: ...we can either wait indefinitely until we have an adequate theory enabling us to deal with socio-metric and political problems as confidently as we do with problems in physics or chemistry, or we can make the most of an admittedly unsatisfactory situation and try to obtain the relevant intuitive insights of experts and then use their judgements as systematically as possible. The use of the DELPHI approach represents an effort to proceed along the second of these alternatives."[5]

Operationally, the DELPHI methodology involves the repeated sampling, usually by questionnaire, of a predetermined group of "experts" in a selected area of study. The multi-round nature of the methodology, coupled with the inclusion of statistical feedback, allows the researcher some control in guiding the participants to the major goal of the excercise; the attainment of a concensus regarding some future development[6]. Employing this medium, the researcher provides anonymity for the participants, and due to the non-interactive nature of the communications mechanism, effectively limits the impact of many dysfunctional elements of group interaction upon the excercise.

In summary, the Delphi allows the researcher the opportunity of exerting a high degree of control over the communication process within a group for the achievement of an end often defined as the attainment of a concensus regarding the defined future issue by the participants.

However the technique was determined to be possess several inherent weaknesses which served to decrease its desirability as a forecasting tool.

An often cited criticism of this technique was that it solicited a multiple series of responses to a given set of questions with the aim of arriving at a

position unanimously agreed to by the participants. In researching the degree of change between rounds of questionnaire administration, Bedford determined that responses did not vary significantly after administration of the second round in a Delphi type excercise[7]. It appeared therefore that concensus attained in this manner may have been, as Sackman stated, a "specious consensus."[8] This criticism raised question as to whether the concensus attained resulted from an actual "meeting of minds" on the part of the participants or whether it in fact represented a direct manifestation of the manipulative mechanical aspects of the technique itself.

The failure of the traditional Delphi to allow for extensive employment of participant commentary, either in the execution of the study or in the analysis of results, [save presentation of statistical summaries arising from questionnaire execution in subsequent round(s)] limited the potential value of the excercise. Necessarily, the value of the Delphi as an exploratory tool and its value as a medium for communication were severely constrained by this ommission. Stemming from the above, the traditional Delphi necessarily failed to incorporate deviant, or non-conforming participant responses into subsequent round feedback and analysis. This facet of the

traditional DELPHI, as observed by Sackman, "...systematically discourages the adversary process and inhibits exploratory thinking."[9]

The establishment of a criterion for the determination and selection of an "expert" panel was mentioned by Sackman as a weakness of the traditional Delphi. He generalized the criticisms regarding "expert" panel selection by stating that "...The DELPHI concept of the expert and its claim to represent valid expert opinion is scientifically untenable and overstated."[10]

Finally, the employment of a singular "expert" panel in execution of the traditional DELPHI may have unnecessarily limited the development of insights into the subject area under study. This was not to infer that traditional experts or "experts through research" were not valid participants, but rather, that a greater scope of opinion within the "expert" participant group may have provided additional perspectives and insights to the subject under study.

THE SPRITE TECHNIQUE

The SPRITE methodology was developed by Bedford in 1973.[11] In developing this techique, Bedford attempted to improve upon the weaknesses of the traditional Delphi technique while endeavouring to

maintain and even strenghten its positive attributes.

The SPRITE technique was found to be operationally similar to the Delphi in that it employed a multi-round questionnaire as the basic tool for data collection from predetermined "expert" panels of participants. Most importantly, for purposes of the proposed study, the SPRITE technique retained and improved upon a fundamental feature of the Delphi; its ability to function as a communication medium.

> "As the Delphi method is used more, experience will indicate its value, and it will evolve on its own or expire. Perhaps it would be more useful to view it as a communications medium rather than simply a system of abstraction, and stress the psychological interactions involved. A ritual often is a very useful device as an aid to thinking, and the Delphi could fulfill this role. Experience has shown that solutions produced by the exercise have a high degree of acceptability to the ones involved in it, and that they are motivated to help in any action that is indicated."[12]

The most noteworthy difference between the SPRITE and the DELPHI techniques was determined to exist not with the mechanical aspects specific to the respective techniques, but rather with the central objective of the overall excercise specific to each of the respective methodologies and the means employed in the attainment of the respective objectives.

While the traditional DELPHI stressed the

development of a concensus as to some future development, the SPRITE technique emphasized exploration of the subject under investigation with no view to the attainment of a concensus. Certainly some development of concensus was expected to develop with the employment of the SPRITE, but this was a phenomenon that was not desired or pursued by the researcher and most likely resulted from natural group dynamics. However, the technique was structured, conceptually and operationally, to permit and encourage an orderly development of dissenting views and opinions as offered by the panel members.

Operationally, the SPRITE technique was observed to have departed from the traditional or conventional Delphi in two main respects. Bedford outlined these as follow:

> i. Increasing emphasis in questionnaires on the comments of panelists, stressing the importance of assumptions, qualifications, interpretation of general trends, and criticism of co-panelists' remarks.
>
> ii. Division of panel into two groups in order to generate and develop new insights - insights that could not be obtained through the use of two panels operating independently.

> These modifications appeared to have improved upon the efficiency of the Delphi technique while still maintaining the most desirable aspects (controlled interaction, anonymous response, flexible design).[13]

The selective employment of participant commentary in both feedback and analytical capacities served to enhance the scope and exploratory value of the exercise as compared to the situation common to that of the traditional DELPHI. The significance of the inclusion of such was reflected in Bedford's comment that "...it is at least as important to identify and qualify the deviant response as it is the median response, since the deviant panelist is evidently subject to different inputs than the other panelists."[14] Implicitly, the deviant response would most likely be substantiated by commentary, which would reflect whether or not the response was relevant to the study. If such commentary was determined not to be relevant, it would be challenged and discounted in the context of the total study by other participants. Reflecting upon Sackman's earlier comment (see [9]), it appeared that the development of a controlled adversary situation may have enhanced the exploratory thinking process necessary to improving the quality of

the future assessment. This, coupled with the lack of emphasis placed upon the attainment of a concensus rendered SPRITE a more applicable research tool than the traditional Delphi in dealing with the exploratory subject material considered.

In consideration of the criticism levied at the expert selection process common to the traditional DELPHI, the SPRITE methodology proposed a more tenable methodology for the selection of the "expert" panel(s). In view of Pill's comment that a DELPHI expert should be defined as "anyone with relevant input,"[15], Bedford proposed that a practitioner (expert through practice) assessment would be just as valid as the traditional expert (expert through research) assessment. Resultantly, the SPRITE technique necessarily required the utilization of multiple "expert" groups thereby allowing for the possibility of enhancing the scope, and consequently the value of the forecasting effort.

Analysis by Bedford, based upon results of a study employing this technique, revealed that when both "expert" group types were familiar with the subject matter, similar levels of expectation of the future were revealed in their responses.[16] Though the expectations did not vary greatly, the perspectives from which the responses were developed,

as evidenced by the commentary, varied significantly highlighting the value of this feature, while simultaneously downplaying the significance of extensive statistical manipulation of quantitative data in the execution of such a study.

COMMON SHORTCOMINGS

A shortcoming common to both techniques under examination existed with the procedure used in developing the first round questionnaire. Material being forwarded for examination vis a vis the SPRITE methodology in Bedford's "A Technology Assessment of Future Home Communication Services" study had its foundation in previous research. Lacking such information, the researcher was left with few options save unilateral development of issues for examination or polling of the study participants for the initial input as suggested in procedure common to the traditional Delphi. Neither of the techniques was found to have been acceptable; the former inapplicable in the context of the proposed study, and the latter inefficient.

In consideration of the unique exploratory reseach effort herein being examined, it was inconceivable that documentation suitable for employment of issue development could be procured. The

complicated and highly subjective nature of the topic precluded the researcher from unilaterally defining a set of issues for examination without due regard for the severe limitations such a procedure might impose upon the ultimate validity of the study. Further, employment of the methodology for development of questionnaire content, as prescribed for use in conjunction with the traditional Delphi, was judged impractical in view of the sample membership and related limitations common to this study.

The procedure designed to provide initial input was modified from that employed in the original Bedford study in order to increase its suitability to the study at hand. Specifically, a group of Level II managers from the defined universe were to be polled as to what they considered to be the relevant issues facing Alberta Government Telephones over the next 23 years. These responses were then to be assimilated, and recycled among the participants, requesting them to select the 25 most relevant issues. From this subsequent polling were determined those issues to be included in the first round study questionnaire. This methodology bore resemblence to the procedure common to the SEER[17] technique which employed a separate expert panel analyzing predetermined issues as a means of further developing and prioritizing actual study

contents for expert review. This methodology, in conjunction with the nature of participants employed for this purpose, was felt to have enhanced the value of the initial questionnaire. It was not felt that the inclusion of these individuals as part of the upper management expert panel later in the study had any detrimental effects upon the final study output due to both the time lag between the procedures and the different nature of input requested relative to each of the procedures.

Based upon the literature search conducted, a qualitative future forecasting technique employing multiple inputs on a set of defined future occurrences was determined to be most applicable to this study. The traditional Delphi technique was determined to be possessive of a number of undesirable features when viewed in the context of this study. The SPRITE technique, though not without fault, was, in conjunction with modifications outlined above, determined to be best suited for purposes of the study and was therefore applied to the research questions outlined.

FOOTNOTES

[1] J.C. Chambers et al, "How to Choose the Right Forecasting Technique." Harvard Business Review (July-Aug. 1971): 49.

[2] Ibid.: 53.

[3] F.J. Doyle and D.Z. Goodwill, An Exploration of the Future in Medical Technology. [Montreal: Bell Canada, (1975)], p. 3.

[4] The history of the technique is discussed in: M.T. Bedford, A Technology Assessment of Future Home Communications Services. A Study Proposal, [Montreal: Bell Canada, (1973)].

[5] N.C. Dalkey, The Delphi Method: An Experimental Study of Group Opinion, [Santa Monica:The Rand Corporation, RM-5888-PR (1969)]. in Y. Pill "The Delphi Method: Substance/ Context; A Critique and an Annonated Bibliography," Socio Economic Planning Sciences, Vol. 5, (1971): 61.

[6] M.T. Bedford,The Value of "Comments"

Analysis and an analysis of SPRITE as a Planning Tool, in L.H. Day, Delphi the Bell Canada Experience, [Montreal: Bell Canada, (1972)], p. 39.

[7] M.T. Bedford, The Value of "Comments" Analysis and an analysis of SPRITE as a Planning Tool, in L.H. Day, Delphi the Bell Canada Experience, [Montreal: Bell Canada, (1972)], p. 39.

[8] H. Sackman, Delphi Assessment, Expert Opinion, Forecasting and the Group Process, [Santa Monica California: The RAND Corporation, R-1283-PR, (1974)], p. 67.

[9] H. Sackman, Delphi Assessment, Expert Opinion, Forecasting and the Group Process, [Santa Monica California: The RAND Corporation, R-1283-PR, (1974)], p. 67.

[10] H. Sackman, Delphi Assessment, Expert Opinion, Forecasting and the Group Process, [Santa Monica California: The RAND Corporation, R-1283-PR, (1974)], p. 68.

[11] M.T. Bedford, A Technology Assessment of Future Home Communications Services. A Study Proposal,

[Montreal: Bell Canada (1973)], p 6.

[12] Y. Pill as quoted in; M.T. Bedford, The Future of Communication Services in the Home, (M.B.A. Thesis. McGill University, 1972), p. 29.

[13] M.T. Bedford,The Value of "Comments" Analysis and an analysis of SPRITE as a Planning Tool, in L.H. Day, ed. Delphi the Bell Canada Experience, [Montreal: Bell Canada, (1972)], p.42.

[14] M.T. Bedford, The Future of Communication Services in the Home, (M.B.A. Thesis. McGill University, 1972), p. 27.

[15] Y. Pill, "The Delphi Method: Substance/ Context; A Critique and an Annonated Bibiliography," Socio Economic Planning Sciences, Vol. 5, (1971): 60.

[16] M.T. Bedford, A Technology Assessment of Future Home Communications Services. A Study Proposal, [Montreal: Bell Canada (1973)], p. 7-8.

[17] George B. Bernstein, et al, A Fifteen Year Forecast of Information Processing Technology. Prepared for Naval Supply Systems Command, [Washington

D.C.: Clearinghouse for Federal Scientific and Technical Information, (1969)], p. 17.

CHAPTER III

RESEARCH METHODOLOGY

The purpose of this section was to discuss sample selection and detail the design of the research instrument, data collection and data analysis procedures asssociated with employment of the SPRITE technique in the execution of this study.

The study was to entail the application of the SPRITE futures forecasting technique to the outlined subject matter. This was to take the form of the construction, administration and analysis of a two round questionnaire. The questionnaire itself was to be developed employing the multi-round technique outlined earlier.

UNIVERSE AND SAMPLE SELECTION

Universe

The universe for the study was defined as all managerial personnel of the Corporate Development Department at Alberta Government Telephones. A more extensive universe within the corporation itself was considered, but in light of the high level of expertise available within this department and as

managerial desires to experiment with the methodology prior to further inclusion of corporate managerial staff, it was decided to forgo this option for purposes of the current study. Consideration was also given to the inclusion of participants from outside of the corporation, but in view of the potentially sensitive nature of subject matter being examined it was felt prudent to confine participation in the study to the defined universe of managers.

In order to facilitate sample selection and the development of "expert" groupings, the universe was subdivided into two categories. The first group was defined as being composed of those members of the Corporate Development managerial staff who occupied Level I management positions. The second group of managers consisted of managers occupying Level II,III,IV and V management positions within the department. It was felt that the rationale previously provided regarding the distinguishing features of the respective management groups justified this procedure.

Sample Selection

The selection of members of the described management group was based upon a judgemental criteria premised on two major factors. First, the members were required to conform to the "expert" qualification as

forwarded by Pill. (See [15]) That is, they were to be practitioners in the subject area being studied, and would therefore be familiar with the material being examined.

Secondly, candidates for the lower management group were required to be other than strictly technical in orientation, or generalists, thereby limiting the potentiality of an overspecialized set of viewpoints developing regarding any paticular issue. Due to the limited size of the second or upper management universe available for study, and in consideration of the high level of influence over the dceision making function exercised by members of this group, the entire upper management group was polled. A list of study experts was not made available due to the sensitive nature of this study.

Procurement of Panelists

Upon definition of the sample groups, the General Supervisorof the department was requested to sanction the study within the selected group by way of a letter to the proposed participants. This letter was then attached to an overview outlining the nature of the proposed study, study objectives, methodology and application of the study results.

QUESTIONNAIRE DESIGN

Rationale

In reviewing the overall objectives of the study, three primary requirements were determined as essential to the actual design of the questionnaire. Specifically, since forecasts were to be entered into a business planning function, it was central to the study that the questionnaire addressed the determination of the probability of occurrence of a described event as well as the probable time of occurrence of such an event. Further, it was necessary to solicit commentary from participants regarding their responses as per those parameters described above.

It was necessary to provide as much capability for standardization as possible within the research instrument in order to minimize the degree of interpretive error arising from data analysis. Accordingly, the first two sections (probability of occurrence and probable time of occurrence), were constructed employing scales designed to standardize the responses as much as possible given the objectives of the study.

The employment of a continuum representing a 0 to 100 percentage point distribution in 5 point increments for the portion of the questions dealing

with the probability of occurrence appeared well suited to the nature of response being solicited. Similarly, the use of intervals or classes for the part of the questions dealing with probable time of occurrence was determined to provide a more realistic and easily comprehensible mode of response structure for the participants. It would not have been reasonable to expect respondents to identify a particular year for a given event occurring as opposed to identifying the most likely group or interval of years in which the occurrence may have initially manifested itself. Additionally, in view of the subject matter being discussed, respondent structured ranges would undoubtedly have appeared, compounding difficulties associated with data interpretation.

Initial Content Development

As previously discussed, this function represented the subject of the modification applied to the existing SPRITE technique. Level II managers from the Market Research, Planning and Development area of Corporate Development were approached and requested to independently document what they felt to be the major issues facing Alberta Government Telephones and the telecommunication environment in Alberta up to and including the year 2000 A.D.. Upon receipt of these

lists, a composite list was developed. These managers were then requested to select the 25 most relevant issues in the context of the defined future from this composite list. The 25 issues most often selected by this group were assimilated into a list which was reviewed and edited by departemental management. The final version of this list was subsequently developed into the first round questionnaire, which was subject to managerial review and approval.

Questionnaire Length

Though the questionnaire length in this type of excercise should have been directly proportionate to the amount of information forwarded for examination, such a practice might have proved impractical. In consideration of the complex nature of the material and the time demands being placed upon the participants, it was determined that a two hour completion time would represent the maximum practical time limitation. Discussions with managerial personnel of the Corporate Development and M.T. Bedford indicated that a twenty to twenty-five item questionnaire would fit within the defined time constraint.

Questionnaire Coding

Each questionnaire was coded using a four digit code with the first two digits identifying the round and respondent affiliation to a group or work unit within the department. The last two digits identified individual respondents for purposes of sample control.

Pretesting of Questionnaire

The first round questionnaire was pretested employing the services of an independant AGT research specialist not participating in the study, the researcher's direct (Level II) supervisor, and the researcher's general (Level IV) supervisor.

Inasmuch as the objective of the pretest was to limit possible mechanical errors within the document, it was also significant to ensure that the material was presented in a manner acceptable to the management of the corporation. As such, a number of issues were deleted from the questionnaire while a majority of those remaining were modified for purposes of clarification and accuracy.

The purpose of the following section shall be to outline the procedure to be employed for the purposes of data collection.

DATA COLLECTION

First Round Questionnaire

Upon development, pretesting and editing, the first round questionnaire was distributed to the "expert" panel members. Included in the instructions was contained a brief outline of the manner in which to structure responses as well as the mention of a 72 hour deadline for questionnaire return to the researcher. The time constraint is being envoked to limit the incidence of non-response resulting from forgetfullness, document misplacement etc..

Second Round Questionnaire

The second round questionnaire was very similar to the first round questionnaire with the exception of two factors. First, poorly worded questions were modified as necessary, and poorly received questions were deleted from further study. Secondly, in addition to the questions, this document contained a statistical summary accompanied by representative commentary relating to each issue further being examined.

Additionally, a modified set of instructions, dealing mainly with response interpretation and further detailed response structuring procedures were provided as part of the second round questionnaire.

Analysis of Data; First Round

Once the first round questionnaires were returned, coding was executed as per the procedure previously described . The data was then processed employing the "ONE WAY FREQUENCY ANALYSIS" program found in the SPSS-V600 system, to obtain a summary of quantitative frequency distributions as well as representative comments as inputs into the development of the second round questionnaire.

Cumulative Data Analysis

The bulk of the final analysis was based upon the second round questionnaire results. Treatments similar to those suggested in the above section were employed. Additionally, analysis was undertaken in order to ascertain inter-group differences and to examine intra-group/inter-round differences as per the defined study objectives.

An overview of the development of an issue from initial identification through to its inclusion in the second round questionnaire is provided in Appendix "B" of the study.

Coding of Comments

Though detailed coding of comments received was considered, indications were that little value

would be gained from even an exhaustive content analysis. As such, comments were not coded or abridged save categorization for the purposes of determining from which group they originated and during which round they occurred. Though it was originally intended to employ direct quotations of the comments in analysis of the material, the mass of material was so large that summarized overviews of the comments became the basis for much of the presentation.

GENERAL

Dropouts

The impact of panelists dropping out of the study during the course of its execution was of some concern relative to the selected methodology. For the purposes of the proposed study, it was determined that the procedural aspects of the SPRITE methodology would contribute to a low dropout rate. The novelty of the exercise within the company, coupled with general interest in the study amongst many participants, inclusive of uppermost management, was expected to aid in reducing the dropout rate. Dropouts were anticipated however, and the following procedures were followed in dealing with such:

i. If a panelist refused or could not

participate in the study at the onset, he was eliminated entirely from further consideration.

ii. If a panelist completed the first round quetionnaire but failed to complete the second round questionnaire, all efforts were made to effect completion of the second round questionnaire.

Schedule of Activities

The sequence of activities associated with the study appear below:

Completion Date		Description of Activity
Oct. 78	i.	Development of study proposal
Oct. 78	ii.	Approval of study proposal
Oct. 78	iii.	Selection of study "expert" sample
Nov. 78	iv.	Development of study issues
Nov. 78	v.	First round questionnaire development
Dec. 78	vi.	Questionnaire pretest
Dec. 78	vii.	Questionnaire approval and administration
Jan. 79	ix.	First round analysis
Jan. 79	x.	Second round questionnaire development

Jan. 79	xi.	Questionnaire approval and administration
Mar. 79	xii.	Preliminary quantitative analysis.
May 79	xiii.	Analysis of commentary and coding.
Nov. 79	xiv.	Preliminary report.
Jan. 80	xv.	Preparation of detailed report.
Oct. 80	xvi.	Preparation of thesis.
Nov. 79	xii.	Second round questionnaire analysis
Oct. 80	xiii.	Final report

CHAPTER IV

RESEARCH RESULTS

In accordance with the study objectives and methodology, the research results concentrated on presentation of the predictions and differences which were developed during the course of the study. Due to the volume of material analyzed, only the highlights of research findings in this section. A more detailed overview of results on an issue by issue basis is found in Appendix "C" of the study. It was determined that such a procedure would serve to maximize the effectiveness of the discussion while limiting the confusion which may have arisen from a more complicated presentation of findings. The key topics included in this section were participation, predictions, differences and consensus formation.

PARTICIPATION

Overall, the participation rates of managers during both rounds of the study were very encouraging. Participation rates were determined employing three measures.

The first of these related to general

participation, which was defined by participant response to any portion of the questionnaire and return of the questionnaire to the researcher in the time-frame outlined. Of 32 eligible participants polled during the first round, all 32 responded. During the course of the second round, 27 of 32 eligible participants responded with 4 lower management group members and one upper management group member becoming study dropouts. The primary factors contributing to the dropout rate were resignation and tranfer which accounted for all 5 cases.

The second manner of participation rate determination was slightly more specific. The total number of individual issues which were responded to (at least one part of the question responded to) were divided by the total numer of possible responses (total questions per contributing participant [21] times the number of participants). The results indicated that the lower management participation rate was 98.9% while the upper management participation rate was 99.7%. During the course of the second round the overall participation rate was 99.6% indicating that those managers who elected to participate generally responded to the entire set of issues forwarded.

A third, but less significant measure of participation employed, was the rate of provisioning of commentary. In this case, a dichotomous measurement scheme was employed; participants contributing a comment or comments regarding an issue were counted as 1. Those not contributing were counted as 0. The rates were calculated based on the adjusted frequency of participating managers. During the first round, 75.9% of the lower management responses and 79.9% of the upper management responses included commentary. During the course of the second round, these figures dropped to 68.4% and 54.7% for the lower and upper management group responses respectively. Reflecting upon the earlier outlined importance of comments to the study, it was felt that excellent cooperation had been received from all participants. In total, 839 comments were reviewed in the development of the response analysis. A detailed overview of the participation rates in both rounds appear in Table 1.

Table 1

Participation Rates; Absolute Frequency

By Group And By Round

Issue	Upper Management Group . Responses		Comments		.	Lower Management Group Responses		Comments	
	RI	RII	RI	RII	.	RI	RII	RI	RII
1.	14	13	13	8	.	18	14	13	11
2.	14	13	11	9	.	18	14	14	10
3.	14	13	11	8	.	17	14	15	10
4.	14	13	10	7	.	18	14	13	9
5.	14	12	12	8	.	18	14	15	10
6.	14	13	13	8	.	18	14	15	8
7.	14	13	11	7	.	18	14	15	9
8.	14	13	12	10	.	18	14	16	10
9.	13	13	10	6	.	18	13	13	9
10.	14	na	13	na	.	18	na	14	na
11.	14	13	10	7	.	18	14	11	10
12.	14	13	10	7	.	17	14	14	9
13.	14	na	10	na	.	18	na	15	na
14.	14	13	11	5	.	17	14	14	10
15.	14	13	12	6	.	18	14	12	10
16.	14	13	11	6	.	17	14	12	8
17.	14	13	10	7	.	18	14	13	9
18.	14	13	11	6	.	18	14	14	10
19.	14	13	11	8	.	18	14	13	9
20.	14	13	11	5	.	18	14	13	11
21.	14	13	12	7	.	18	14	13	10

PREDICTIONS

In order to aid in the streamlining of both analysis and presentation of results, the research issues studied were categorized by basic content. The first of the three major categories employed contained those dealing with administrative or control related factors. These factors were generally viewed as being directly influenced by the corporation and were mainly internal in nature. The second category was composed of issues dealing with competitive entities, activities or influences bearing imapct upon AGT. These issues were generally noted to fall outside of the sphere of direct AGT control and were both regional and national/international in scope. The third category included those issues pertaining to the technical and service related aspects of the telecommunications business environment. These dealt with the development, implementation or impact of both AGT controlled and non-AGT controlled activities of this nature. A detailed categorization of issues employing this methodology appears in Table 2 which follows entitled "Categorization Of Research Issues." Overviews of both upper and lower management predictions appear in Table 3 and Table 4 respectively.

TABLE 2

Categorization of Issues

Category 1. - Competitive Issues

Outright Sale
CN/CP Interconnection
Competitive Long-Haul
CATV Competition

Category 2. - Administrative / Control Issues

Profit Centre Responsibility Structuring
U.S./Canadian Policy Similarity
Cost/Revenue Separation
Financial Subsidization
Usage Sensitive Pricing
Employment of External Management
Zero Based Budgeting
TCTS Incorporation
CATV/AGT Cooperation

Category 3. - Technological/Service Issues

System Intelligence Shift
Optical Fibre Penetration
Satellite
Electronic Mail
Information Retrieval
Network Integration

Table 3

Upper Management Predictions

Rank Ordered By Median Probability

of Occurrence Values

Rank	Description	Issue Number	Median Value
1	Outright Sale	15	95.25%
2	Information Retrieval	2*	89.67%
3	Cost/Revenue Separation	6	80.0%
4	CN/CP Interconnection	11	80.0%
5	Fibre Optics Penetration	1*	79.88%
6	Profit Center Control	17	79.63%
7	ZBB Implementation	12*	70.4%
8	Network Integration	3*	70.0%
9	Competitive Long-Haul	14	70.0%
10	U.S.P. Implementation	7	69.88%
11	CATV/AGT Cooperation	19*	69.75%
12	Policy Similarity	18	69.71%
13	Satellite Communications	9	59.63%
14	System Intelligence Shift	16*	50.38%
15	Electronic Mail	4	50.2%
16	External Management	20	50.14%
17	TCTS Incorporation	5	30.1%
18	CATV Competitiion	21*	29.67%
19	Financial Subsidization	8*	20.13

* Indicates those issues to which the median values of responses provided by both groups varied more than 10 percentage points.

Table 4

Lower Management Predictions

Rank Ordered By Median Probability

of Occurrence Values

Rank	Description	Issue Number	Median Value
1	Outright Sale	15	90.0%
2	CN/CP Interconnect	11	80.0%
3	System Intelligence Shift	16*	79.75%
4	Profit Center Control	17	79.70%
5	Policy Similarity	18	75.5%
6	Cost/Revenue Separation	6	70.5%
7	Competitive Long-Haul	14	70.1%
8	Financial Subsidization	8*	70.0%
9	U.S.P. Implementation	7	60.5%
10	Fibre Optic Penetration	1*	59.75%
11	Satellite Communications	9	59.75%
12	Electronic Mail	4	50.75%
13	Information Retrieval	2*	50.33%
14	External Management	20	50.17%
15	Network Integration	3*	49.75%
16	ZBB Implementation	12*	49.67%
17	CATV Competition	21*	40.5%
18	TCTS Incorporation	5	20.5%
19	CATV/AGT Cooperation	19*	20.33

* Indicates those issues to which the median values of responses provided by both groups varied more than 10 percentage points.

Overall, the upper management group envisioned a future characterized by increased competitive activity, increased technological/service development and a general upgrading of AGT management practices. Though many existing factors in this regard were felt as growing in magnitude, it was not certain that any structural changes would occur in the local or national telecommunication arenas. In summary, though the future was envisioned as being more demanding, upper management was of the opinion that AGT would continue to cope effectively.

Probably the most accurate term used to describe the upper managerial view of the future role of competition was "inevitable". It was clear that network interconnect companies and terminal equipment provisioners would continue to exert increasing pressure on the marketplace and upon AGT. Though the acceptance of the outright sale mode of operation was considered a forgone conclusion, other associated factors such as the shifting of system intelligence away from the network were not viewed as having a similar probability of occurrence. Though generally positive in their future view, upper management often hedged and qualified their responses. The statement which probably most clearly reflected the concerns of this group indicated that AGT and other existing

telephone companies would be lucky to maintain the suggested 75% share of the long-haul toll market as of the year 2000 A.D. in the context of the described level of competitive activity.

Upper management views of the future related to administrative and control issues reflected a requirement for improvement of management practices within AGT. The regulatory elements were envisioned as having much impact on the separation of costs and revenues, implementation of U.S.P. and extension of the profit centre mode of responsibility structuring. Though these issues of an operational and externally motivated nature were seen as most probably developing, broader and less tangible issues relating to the managerial control function were not viewed with equal optimism. Factors as TCTS function and incorporation and the topic of Provincial Government financial subsidization rated only secondary rankings in the future AGT control scenario.

The impact of service concepts and technology related to existing or currently proposed programs such as network integration, optical fibre utilization etc. were seen as playing prominent roles in AGT's future. Other less well defined technologies, such as satellites were not necessarily seen as playing as significant a role in the future of AGT as was

suggested in the statement of the issues related to these services. Though considered a developing factor, the shifting of system intelligence from the network to the terminal was not considered a major force impacting the future and AGT was viewed as retaining the level of network/service control currently enjoyed.

In summary, upper management predictions depicted a future characterized most notably by increased competition in both network and terminal areas. Via the upgrading of internal management control practices and procedures, upper management implied that AGT would effectively meet the challenges of the future. Though operating in a more demanding and dynamic environment, management did not envision the development any structural shifts which might erode the current level of control exerted by AGT over the networking function. In essence, though some adjustments were felt necessary, no fundamental changes in AGT managerial philosophy were viewed as being required in ensuring long term corporate viability.

The lower managemet group developed a future view characterized by increased competition and an increased requirement to effectively manage the business. Technology and service development were not viewed as major factors contributing to the

development of the future scenario for AGT. The key factors viewed as shaping the future of AGT were consumer/market forces and the lack of senior managerial talent within AGT.

Competition was viewed by lower management as playing the primary role in the future and future development of AGT. It was carefully qualified that the competition would occur in the areas of network interconnection and terminal sales rather than in the local service provisioning market. Though in many ways beneficial to AGT, the forthcoming competitiveness was also depicted as forcing a shift in system intelligence, (and consequently network control away from AGT), creating a requirement to improve internal control procedures and raising the need for a realignment of managerial strategy and philosophy within AGT. Aside from the threats inherent to increased competition, lower management felt that upper managerial inability to cope effectively with the changes would undermine AGT's viability.

Predictions relative to administrative issues portrayed a future consisting of increased U.S. influence and greater emphasis on the aspects of internal control scrutinized by regulatory bodies. Accordingly, such issues as cost/revenue separation and profit centre responsibility structuring were

alloted high probabilities of occurrence. Conversely, those aspects of the control function not heavily scrutinized by external bodies, such as ZBB and external mangement recruitment, though considered necessary, were not considered likely to occur. It was clear that this group viewed AGT as assuming a strictly reactive stance regarding external pressures in respesct to the improvement of control and administrative procedures. Due mainly to increasing competition in all areas of the telecommunications environment, both U.S.P. and increased Provincial Government financial subsidization were envisioned as becoming likely aspects of AGT's future being. Finally, the broader issues dealing with AGT/CATV cooperation and TCTS incorporation were felt as being undesirable and avoidable and were therefore not assigned much chance of occurring in the defined time-frame.

Technological and service developments were viewed by lower managers as being merely manifestations of market requirements and network capabilities. These factors were therefore not viewed as having as much impact on the future of AGT as were the factors of competition and AGT's strategic positioning. The service concepts forwarded for discussion were only ascribed marginal probabilities

of occurrence, with the major influences on these being market requirement and consumer acceptance. This view was consistent with other lower management views which suggested that the role of AGT would be determined more by the competition and market than by technology or service availability.

In conclusion, increased competition and marginal financial performance were envisioned as key factors impacting the future of AGT. From a internally oriented perspective, lower management predicted that AGT would attempt to align itself with environmental developments but only on an "as required" basis. Technology and service development were not viewed as major forces shaping the future environment and more emphasis was placed upon the felt requirement for effective strategic positioning of the corporation. Finally, though a multitude of factors were envisioned as impacting the future, senior AGT management was often forseen as being a key influence limiting AGT's future effectiveness.

DIFFERENCES

A second key result area associated with the study dealt with the identification and examination of differences between the participating management groups. Though there existed two types of differences,

in prediction and in the rationale provided, the bulk of this analysis dealt with the former. The median values of the assigned probability of occurrence were the major sources of statistical data employed in this analysis from a quantitative perspective. However, due to the complex nature of the material, much of the insight into the differences was obtained via the analysis of commentary. An overview of differences in median values of probability of occurrence responses appears in Table 5.

Though most predictions of probability of occurrence values varied between the groups, seven issues revealed marked differences to have developed between the positions of the two groups. Of these seven issues, four were concerned with issues which were determined to have been of a technological/service nature. These included those issues dealing with centralized information retrieval, optical fibre penetration, voice-video-data integration, and shifting in the incidence of system intelligence.

The second major set of differences appeared to have been centered upon factors dealing with three administrative issues. These included those dealing with ZBB implementation, AGT - CATV joint venturing

Table 5

Comparison of Median Values of Responses

To Probability of Occurrence Question

Upper Versus Lower Management Group

Description	Upper Management	Lower Management
Fibre Optic Penetration	79.88%	59.75%
Information Retrieval	89.67%*	50.33%*
Network Integration	70.0%*	49.75%*
Electronic Mail	50.2%	50.75%
TCTS Incorporation	30.1%	20.5%
Cost/Revenue Separation	80.0%	70.5%
U.S.P. Implementation	69.88%	60.5%
Financial Subsidization	20.13%*	70.0%*
Satellite Communications	59.63%	59.75%
CN/CP Interconnection	80.0%	80.0%
ZBB Implementation	70.4%*	49.67%*
Competitive Long-Haul	70.0%	70.1%
Outright Sale	95.25%	90.0%
System Intelligence Shift	50.38%*	79.75%*
Profit Centre Control	79.63%	79.70%
Policy Similarity	69.71	75.5%
CATV/AGT Cooperation	69.75%*	20.33%*
External Management	50.14%	50.17%
CATV Competition	29.67%*	40.5%*

The issues appear in the same order as in the questionnaire.

* Indicates those issues to which the median values of responses provided by both groups varied more than 10 percentage points.

and Government subsidization. It was notewothy that the greatest differences observed between the two groups occurred with respect to very fundamental issues regarding the future existance of AGT; financing and posturing relative to competitive entities in the telecommunications environment.

The above outlined differences relative the technological/service provisioning issues helped point to the upper management group's greater concern with technology and service development as compared to the lower management group. Upper management appeared to have premised their views on the assumptions that these services were required, desirable and that the provisioning requirements could be easily met by AGT. Lower management predictions suggested a less positive view of such based on the assumptions that the services and markets were both poorly defined. Conversely, lower management believed that competitive forces would play a major role in service development much to the detriment of AGT plans in this area

An important difference was noted to have developed regarding the issue of the shifting of system intelligence from the network. While the upper management group did not envision a high probability of occurrence, the lower management group intimated that this was inevitable in view of competitive and

technological forces bearing influence upon this factor. It was also implied by the lower management group that the current upper management philosophies were mitigating forces eroding AGT's ability to control and manage this phenomenon.

Relative to issues of an administrative nature, upper management generally held a more positive view of the future than their lower management counterparts. While upper management participants were generally favorably disposed to the notion of ZBB and felt confident in being able to implement it, lower management was less convinced of the latter. Similarly, upper management predicted that joint venturing with CATV companies would most likely occur as a result of the mutual benefits available the participants. Lower management group members were opposed to this notion and envisioned only a remote probability of this occurring, thereby indicating the existence of a significant rift between the attitudes of the respective management groups within the Corporate Development department of AGT.

This difference was further highlighted via responses to the issue dealing with the AGT requirement for Provincial Government financial subsidization. The response structures were very divergent, with the lower management group indicating

a very high probability of continued subsidization occurring while the upper management group generally indicated that such a phenomenon would probably not occur. The lower management position was substantiated by observations which indicated that increasing competitive pressures, non-compensatory rating structures and senior managerial ineptitude would continue to create the need for the described subsidization. Upper management indicated that via increased rigor in dealing with factors both internal and external to AGT, the future challenges facing AGT would be met thereby precluding the requirement for Provincial Government financial subsidization. Though interpretive error in dealing with the issue might have impacted the results, it was clear that a fundamental difference in future view existed between the management groups regarding this basic factor of AGT's contemporary and future existence.

Though numerous differences were uncovered in dealing with administrative and technological/service issues, fewer were discovered analyzing the issues dealing with competition. With the exception of the issue dealing with CATV competition, where the median values of probability of occurrence varied almost 11 percentage points, other predictions were fairly similar. Management views of CN/CP interconnection,

long-haul competition and outright sale were very similar for both groups. Perhaps the best explanation for this phenomenon was founded on the observation that these occurrences, being externally driven, were more objectively viewed and addressed by all levels of management within AGT thereby contributing to the similar set of predictions which were observed.

Summarizing, the upper management group held a more positive view of the future than the lower management group. The overall nature of the future environment as evinced from upper managerial predictions was more closely related to existing activities and directions being pursued by AGT than were lower management predictions. Accordingly, upper management held a much more positive view of AGT management's ability to meet the future challenges than did the lower management group members, who felt that AGT's impact upon it's environment would continue to diminish over time. A fundamental difference between the groups appeared to have centered on managerial attitudinal positioning. While the lower management group continually differentiated between what would be desirable as opposed to probable, the upper management group rarely did so, preferring a less complex approach to the issues. Consistent with this difference was the often stated view of the lower

management group members that one of the key difficulties facing AGT in the future would no doubt be an ineffective senior management.

CONSENSUS FORMATION

Aside from the predictions and differences, one of the more interesting aspects of the study results was the tendency toward the formation of consensus as exhibited by both groups. It was speculated that the very nature of the SPRITE technique would serve to limit the occurrence of this factor. However, in analyzing responses to both the the "probability of occurrence" and "probable time of occurrence" questions in the course of both rounds, very definite tendencies indicating the formation of concensus, but not necessarily attainment of such, were observed. This trend was exhibited in 18 of 19 upper management group responses and 16 of 19 lower management cases when the changes in the value of inter-quartile ranges of responses between rounds were analyzed.

Does this imply that the SPRITE technique was ineffective in terms of avoiding the development of concensus in favor of a more expansive subject exploration? Certainly not! In further analyzing the degree of change exhibited in the subject responses in

the case of the upper management group, the decrease in inter-quartile ranges of reponses varied from 5.11 percentage points to 43.9 percentage points, the mean value of these being 22.56 percentage points. The decreases in lower management inter-quartile range of response values varied from a low shift of 5.15 percentage points to a high value of 44.68 percentage points, the mean value of the decreases being 22.68 percentage points. Even after being somewhat compressed, many of the inter-quartile range of response values were in the 40 and 50 percentage point range, thereby indicating the existence of a diverse set of views within the given response ranges.

It was speculated that the tendency toward the formation of consensus was mitigated by one or more of the factors outlined below:

1. In view of the feedback provisioned, some members may have felt a need to modify their views and align them more closely with those of the group at large.
2. In view of the communication being fostered through the medium itself, some participants may have been availed of new information regarding the subject matter; information which could readily influence a moderation of

position and opinion.

3. During the course of the study, five participants dropped out of the study. Their absence in the course of the second round may have contributed to a shift in response patterns.

4. It appeared that the first round responses were somewhat more emotionally and less rigorously considered than were the second round responses. It followed therefore, that there would have existed less propensity to forward poorly rationalized, illogical or outlandish positions in the second round as opposed to the first, perhaps contributing to the formation of consensus.

The major conclusions of the research effort are presented in the next chapter.

CHAPTER V

CONCLUSION

GENERAL

The study appeared to have succeeded in establishing the value of the modified SPRITE technique with respect to the defined study objectives. Though the direct study output in the form of predictions and analysis of differences was useful to AGT as an input into their planning function, it also served as a vehicle for assessment of the status and effectiveness of the planning process within the defined context. The study clearly established that the SPRITE technique yielded three major outputs. First, the technique enabled the development of a limited forecast of the future and analysis of differences between management groups as originally intended. Second, as evidenced from the commentary reviewed, the technique served to foster a certain degree of communication among the participants. Third, the technique proved effective as a tool aiding in evaluation of the planning process employed within the study universe. In summary, it was concluded that the SPRITE technique was well suited to the nature of the study executed and further research in ascertaining

its applicability in the planning environment would be desirable.

RESEARCH QUESTIONS

The two major research questions forwarded for examination were supported in the course of the study. First, the question which dealt with the determinability and predictability of certain key characteristics of future factors appeared to have been well supported. Not only were a fairly extensive array of key issues formulated via the modification to the SPRITE technique, but probabilities of occurrence, probable time of occurrence values and substantive commentary were ascertained for such. The material presented in the Chapter IV, "RESEARCH RESULTS", provided sufficient evidence to this end.

The second major research question tested dealt with the view that certain differences in future view and orientation existed between the two management groups, and that these differences were identifiable and explicable to a certain degree. A review of the results, both from quantitative and qualitative perspectives indicated the management groups were differently aligned with respect to certain key issues. In being able to identify these differences and offer at least some explanation for

such, the research question was satisfied.

Based upon the above it became clear that AGT suffered from some identifiable shortcomings in its planning process. This was not to infer that the differences in opinion with respect to certain issues were necessarily symptomatic of dysfunctional factors within the planning function, but rather, these served to highlight the lack of rigor, formality and expertise common to the process within a leading edge planning group. Analysis of comments associated with opposing views between the groups suggested that the communication process common to the studied planning process was most likely a key factor contributing to the above forwarded description of the state of the planning process and was in need of further attention by AGT management.

APPLICABILITY OF SPRITE

As originally speculated, the paucity of historical data, coupled with the uncertain and highly dynamic future situation rendered qualitative futures forecasting methodologies more suitable for employment in the defined study than other available techniques. Aside from those attributes upon which merits the technique was selected, factors which were felt to have contributed its high level of suitability are

outlined below:

i. The encouragement of the provisioning of commentary and its extensive use in both the study execution and analysis provided valuable insights not only in terms of predictions, but also into the state of the planning process as a whole. The technique aided, therefore in expanding the scope of the excercise beyond a forecasting study.

ii. Based upon the second round responses, the technique appeared to have proved effective as acommunications medium among the study participants.

iii. The mechanical aspects of the technique, in particular the modification of the initial content development, appeared to have provided for a high level of interest and consequently participation among the participants and aided in the attainment of the outlined study objectives.

The fact that information, as outlined in the study objectives, was gathered, analyzed and presented in an orderly and systematic fashion was felt to have represented a major accomplishment in the selected

study area. More importantly however, the technique demonstrated the nature of information available via the application of the modified SPRITE technique to have been consistent with defined study requirements. It was evident that the application of the modified SPRITE technique provided an efficient, effective and comprehensive means of addressing a very complex subject area in the business environment.

One of the principal features of the technique employed was the modification performed to the manner in which the content of the research instrument was developed. Based upon the high level of participation in both rounds, it appeared that the modification proved successful in identifying key issues for inclusion in the initial research questionnaire. The fact that only two of twenty-one issues were deleted in the context of the second round due to poor initial reaction and that few adverse respondent comments were received further added support to this assessment of the modification. Lastly, the interest expressed in the issues by the participants as evidenced via the commentary provided suggested that the issues were relevant and worthy of the high degree of effort applied by many of the participants. Other variations may also have proven desirable, however the exploratory nature of the work,

both in terms of application and expected output, precluded additional modifications from being enacted.

From a methodological perspective, the technique proved satisfactory, but was not without its difficulties. Though execution of the study proceeded fairly smoothly, several shortcomings were noted to have existed:

i. The selection of comments for inclusion in the second round of the study was difficult, as it was felt important to present a generally accurate portrayal of group sentiments; sentiments which were often widely divergent and difficult to encapsulate.

ii. The analysis of comments for purposes of the final report was similarily difficult. The sheer volume of material made the task very demanding; as did the degree of rigor necessary to make the presentation of results as clear and concise as possible. Further, any abridgement or editing may have severely limited the nuances and subtleties which were important aspects of the comments recieved. Resultantly, comments were analyzed for position or attittude, grouped and overviewed as best as possible in view of the competing

requirements of accuracy and efficiency.

iii. There were a number of instances in which quantitative responses were recieved but without the support of comments. As such, it was at times difficult to provide the depth of insight and analysis to certain issues as opposed to others. Further, as with all techniques of a similar nature, such difficulties as varying quality of panelist input, misinterpretation of information etc. were no doubt common to this exercise also.

The study was intended as an exploratory exercise and did not deal with the methodological aspects of the technique or its application in an detailed fashion. Accordingly, a number of issues suitable for future research and examination were delineated. From a methodological point of view it was clear that numerous improvements could be made to the technique. In particular, the procedures used to analyze qualitative information, present results and develop questionnaire content could all stand various degrees of refinement. The streamlining of the technique, to make it somewhat less tedious for the participants would also improve the quality of the exercise from both the participant's and researcher's

perspectives.

SUGGESTIONS FOR FURTHER RESEARCH

From an applications perspective the purely exploratory nature of the exercise pointed for the need for additional research in a number of areas. Aside from general research concerned with further ascertaining the applicability of SPRITE in the business environment and research aimed at further refining the methodology, some specific applications were envisioned. These included:

i. Expansion of the issues, scope of issues and the scope of the "expert" universe common to this study in order to provide a more complete overview of the future environment being addressed.

ii. The development of a hierarchal SPRITE. The purpose of the excercise would be the development of future forecasts following the traditional managerial hierarchy of the organization. The key assumption on which the exercise would be premised would be that objectives should flow downward from uppermost management through the organization and plans and information should, to a great

degree, flow in the reverse direction. Operationally, the directors of the corporation would be subjected to an exercise similar to that herein presented. The output of thes study would then serve as the input to a somewhat more extensve and detailed examination of the same material by middle management within the organization, again utilizing the SPRITE methodology. This material would then come under review, employing similar techniques, by organizatinal specialists in the various subject areas. Finally, this information would flow to the uppermost management and hopefully would provide a much more comprehensive view of the subject matter than was previously available.

Generally, it would be very desirable to further explore the possibilities of employing the SPRITE technique as a diagnostic tool in the business planning environment. The insights provided via the exploration of differences between the groups in the contained study pointed to an interesting possibility. If it were possible to identify key issues of contention regarding the future within planning

groups, it might be possible to employ the SPRITE technique in examining the nature of the differences; and assessing the planning process in a much more efficient manner than is now possible. Accordingly, it was felt that the greatest worth of the SPRITE will be found in its use as an unobtrusive diagnostic tool in the planning environment rather than merely as a futures forecasting technique.

From an methodological perspective, it would be very interesting to further research the hypothesis that differing "expert" panel groups, possessive of high degrees of familiarity regarding some subject, might not necessarily hold similar expectations. This might aid in further ascertaining the applicability of the SPRITE technique to more diagnostically oriented applications in both the academic and business environments.

SUMMARY STATEMENT

The study represented an important extension of futures forecasting within the sponsoring organization. Based upon the quality and scope of input material gathered, the analysis performed and in view of the study objectives, this exercise was felt to have been highly successful. The expanded capabilities of the SPRITE technique, as ascertained

herein, proved very valuable to the success of this study, and further exploration of these capabilities is recommended. It is hoped that future efforts will expand upon the application of continually refined qualitative futures forecasting techniques, thereby heightening the acceptance of these techniques as valuable tools in the business planning environment.

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APPENDIX A

NOTE:

The material in this Appendix consists of four organizational charts starting with an overall corporate perspective and ranging to a departmental perspective.

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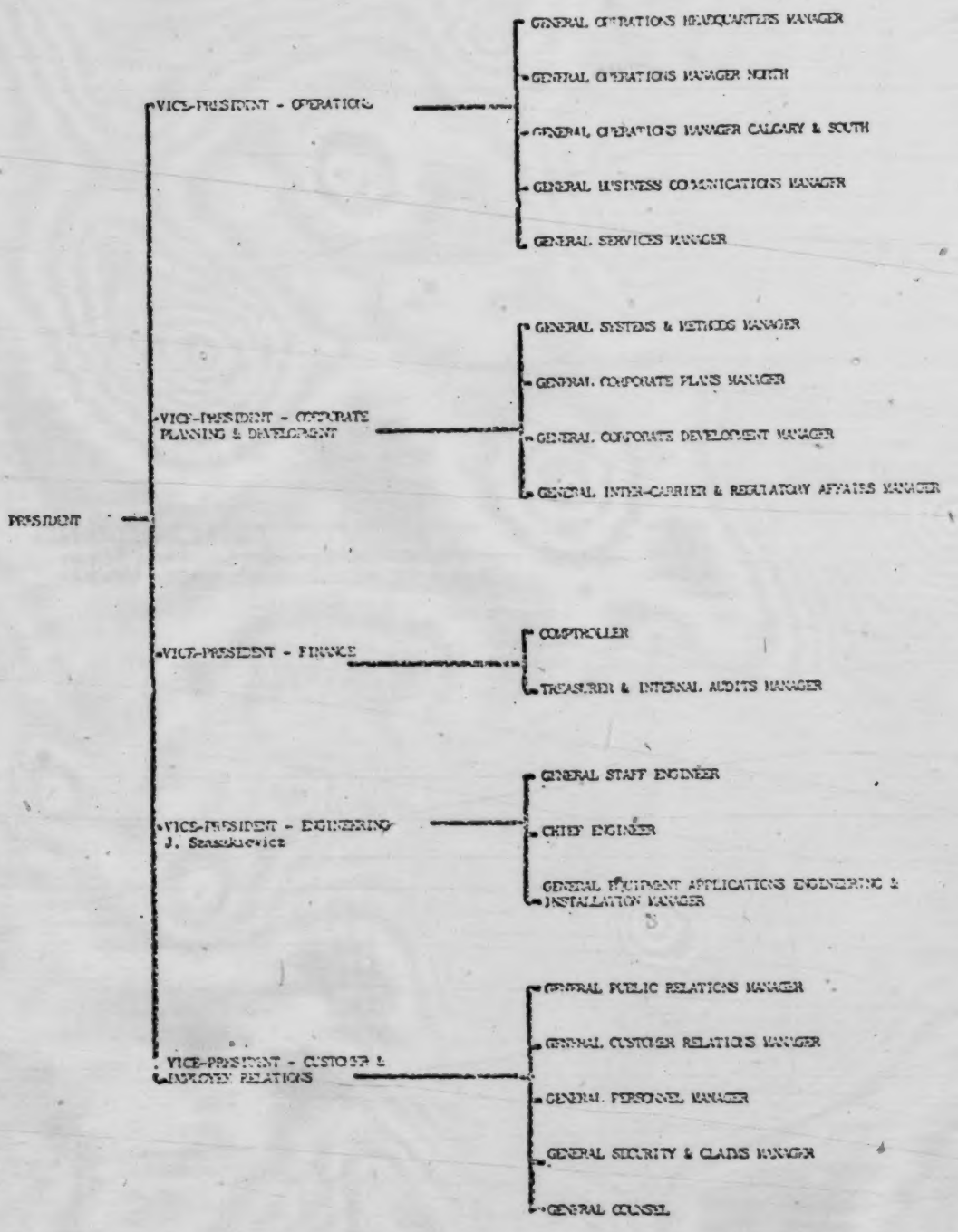
EXECUTIVE & DEPARTMENT HEADS


PRESIDENT
VICE-PRESIDENT - OPERATIONS
GENERAL OPERATIONS HEADQUARTERS MANAGER
GENERAL OPERATIONS MANAGER NORTH
GENERAL OPERATIONS MANAGER CALGARY & SOUTH
GENERAL BUSINESS COMMUNICATIONS MANAGER
GENERAL SERVICES MANAGER
VICE-PRESIDENT - CORPORATE PLANNING & DEVELOPMENT
GENERAL SYSTEMS & METHODS MANAGER
GENERAL CORPORATE PLANS MANAGER
GENERAL CORPORATE DEVELOPMENT MANAGER
GENERAL INTER-CARRIER & REGULATORY AFFAIRS MANAGER
VICE-PRESIDENT - FINANCE
COMPTROLLER
TREASURER & INTERNAL AUDITS MANAGER
VICE-PRESIDENT - ENGINEERING J. Szaszkiewicz
GENERAL STAFF ENGINEER
CHIEF ENGINEER
GENERAL EQUIPMENT APPLICATIONS ENGINEERING & INSTALLATION MANAGER
VICE-PRESIDENT - CUSTOMER & EMPLOYEE RELATIONS
GENERAL PUBLIC RELATIONS MANAGER
GENERAL CUSTOMER RELATIONS MANAGER
GENERAL PERSONNEL MANAGER
GENERAL SECURITY & CLAIMS MANAGER
GENERAL COUNSEL

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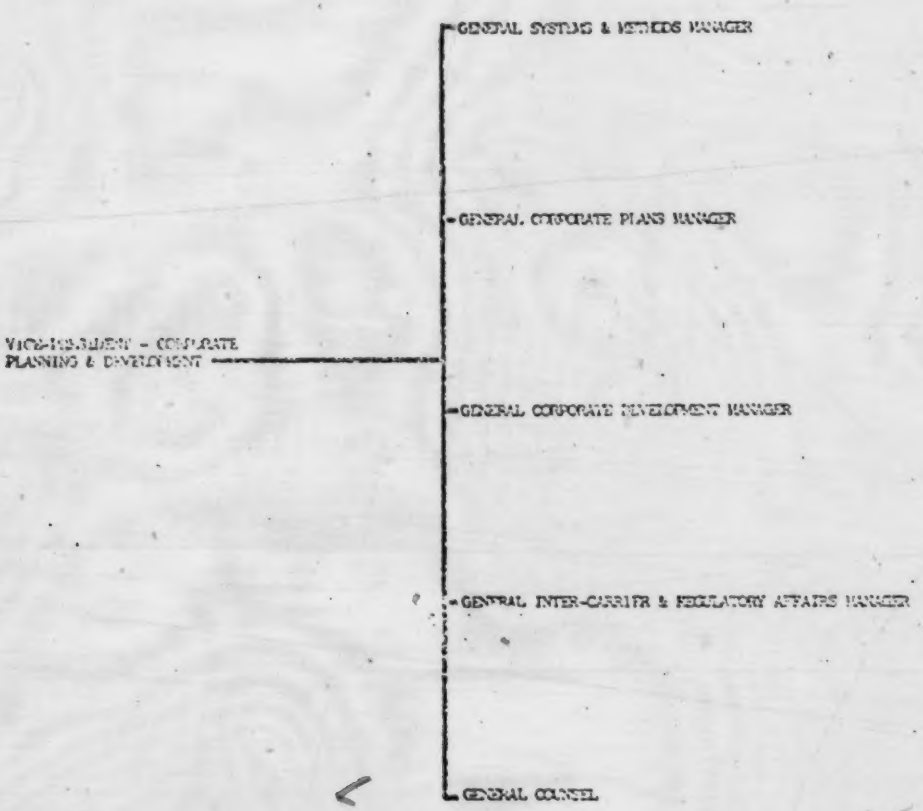
CORPORATE PLANS & DEVELOPMENT


GENERAL SYSTEMS & METHODS MANAGER
GENERAL CORPORATE PLANS MANAGER
VICE-PRESIDENT - CORPORATE PLANNING & DEVELOPMENT
GENERAL CORPORATE DEVELOPMENT MANAGER
GENERAL INTER-CARRIER & REGULATORY AFFAIRS MANAGER
GENERAL COUNSEL

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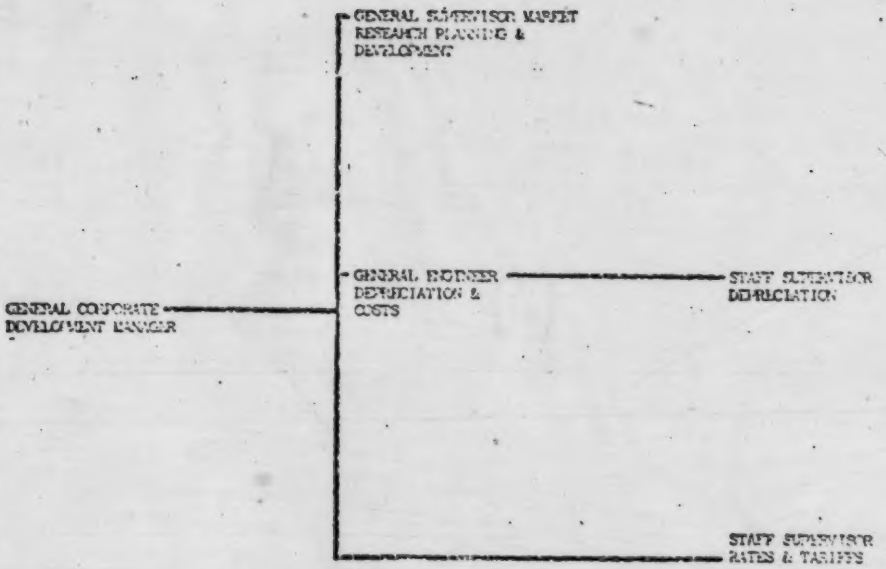
CORPORATE DEVELOPMENT



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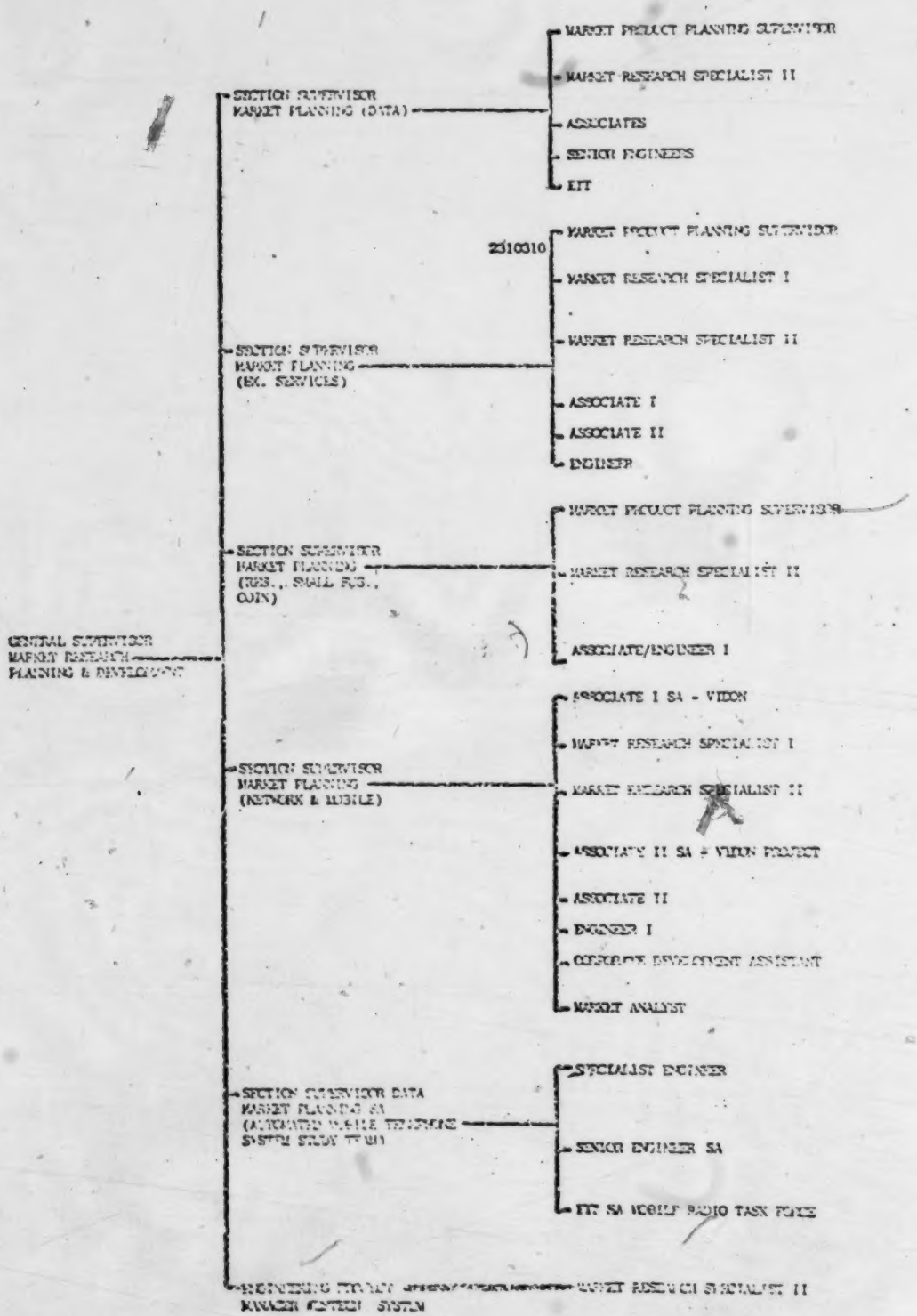
CORPORATE DEVELOPMENT



APPENDIX B

The development of an issue, from original presentaition to inclusion in the second round study questionnaire is outlined via the following example.

1. The issue "AGT shall make the option of outright purchase of business terminal equipement inicluding PABX's and PBX's available to business customers" was forwarde for study by a member of the input panel. This panel consisted of Level II Corporate Development managers who were asked to outline what they considered to represent the most likely future state for AGT.

2. The issue was then recirculated, along with approximately 55 others to this group and they were asked to select the twenty-five issues which they felt most likely represented a likely future set for AGT.

3. The twenty-five issues were then presented to senior departmental management for review and twenty-one of these, including the example issue were employed as the basis for the first round questionnaire.

4. The issue was then developed, along with

appropriate queries regarding probability and probable time of occurrence into an element of the first round questionnaire. The sample first round question and associated instructions appear in Exhibit 1 of this Appendix.

5. Once administered and responded to, data common to this issue was analyzed, and representative feedback was developed for inclusion with the second round of the exercise.

6. If necessary, the issues were clarified or adjusted for inclusion in the second round of the study. Feedback in the form of statistical overviews and comments was also provided. A sample second round question appears in Exhibit 2 of this Appendix.

7. Results from the second round of the questionnaire were then analyzed and employed as the basis for the required analysis.

EXHIBIT 1

AGT FUTURES STUDY

ROUND #1

INSTRUCTIONS:

1. Please read each statement carefully and select only one response in each of Sections A & B.

2. Please forward your comments in the space provided (Section C). Again, comments are critical to the success of this study.

3. In order to retain anonymity, please refrain from discussing this questionnaire with anyone save the researcher.

4. Please return the questionnaire in the self-addressed envelope provided within 72 hours from the time of receipt of the document.

5. If you have any questions concerning this study please contact the researcher.

Thank you.

AGT SHALL OFFER ALL SUBSCRIBER EQUIPMENTS FOR OUTRIGHT PURCHASE INCLUDING PABX AND KEY SYSTEMS IN COMPETITION WITH PRIVATE SUPPLIERS IN THIS AREA.

A) What probability (%) would you assign to the described outright sale of subscriber equipment being effected within AGT?

0 25 50 75 100 %

B) During which time period would AGT be most likely to effect such an offer?

Next 5 Yrs	Next 6-10 Yrs	Next 11-15 Yrs	Next 16-20 Yrs	Next 21-25 Yrs	Never
—	—	—	—	—	—

C) Comments

EXHIBIT 2

FUTURES STUDY ROUND #2

1. Please check the upper righthand corner of your questionnaire cover page to determine which expert group (upper or lower management) you are affiliated with for purposes of this study.

2. Please read Round #2 questions carefully as some slight modifications in wording may have been effected for purposes of clarification.

3. Please respond to Round #2 questions in consideration of the Round #1 feedback provided. Note: Attainment of concensus is not the objective of this study.

4. Please respond to all questions.

5. Comments are critical to the success of this study and your provisioning of such, be they directed as substantiating your position, commenting on Round #1 feedback, etc. is appreciated.

6. Should you experience any difficulties or have any questions regarding Round #2 please contact W. W. Horbay at 4251.

Thank You.

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INTERPRETATION OF FEEDBACK

1. Take note of which group you are affiliated with for purposes of this study. (See Round #2 Instructions, Item #1).

2. Immediately following the Round #2 question appears the Round #1 feedback associated with this question.

   A) Round #1 Probability of occurrence

      The scale is divided into increments of 10% ranging from 0% to 100%. The black bar indicates the semi-quartile response range (25th to 75th percentiles of responses) for upper management, with the white half-diamond indicating the median (50th percentile) of responses. The converse color scheme is employed in illustrating lower management response characteristics.

   B) Round #1 Probable time of occurrence.

      Due to the nature of the scale, presentation of absolute frequency of responses was employed. The top line represents the upper management (U.M.) response distribution while the lower line represents lower management (L.M.) response distribution. The mode (most often occuring response) is indicated for each group with an asterisk.

   C) Round #1 Comments.

      Selected Round #1 commentary appears on the page opposite that containing the similar Round #1 question and Round #1 A) & B) section feedback. The actual Round #1 question appears at the top of the page in the question, as presented in Round #1, prior to examining the comments. Note: The comments are presented without editing or modification.

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AGT SHALL OFFER ALL SUBSCRIBER EQUIPMENTS FOR OUTRIGHT SALE PURCHASE INCLUDING PABX AND KEY SYSTEMS IN COMPETITION WITH PRIVATE SUPPLIERS IN THIS AREA.

A) What probability (%) would you assign to the described outright sale of subscriber equipment being effected within AGT prior to 2000 A.D.?

0 10 20 30 40 50 60 70 80 90 100 %

B) During which time period would AGT be most likely to effect such an offer?

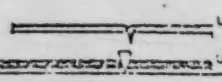
Next 5 Yrs	Next 6-10 Yrs	Next 11-15 Yrs	Next 16-20 Yrs	Next 21-25 Yrs	Never

C) COMMENTS: _____

****

ROUND #1 FEEDBACK

A) Probability of occurrence prior to 2000 A.D. (Median Value)



0 10 20 30 40 50 60 70 80 90 100 %

B) Probable time of occurrence. (Absolute Frequency)

Next 5 Yrs	Next 6-10 Yrs	Next 11-15 Yrs	Next 16-20 Yrs	Next 21-25 Yrs	Never	
3	10*	0	1	0	0	U.M.
8*	7	1	0	1	0	L.M.

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ROUND #1 COMMENTS

AGT SHALL OFFER ALL SUBSCRIBER EQUIPMENTS FOR OUTRIGHT PURCHASE INCLUDING PABX AND KEY SYSTEMS IN COMPETITION WITH PRIVATE SUPPLIERS IN THIS AREA.

Selected Upper Management Group Comments

Our present mode of operation and mentality towards the consumer does not really lend itself to this concept.

Could be sooner (than 6-10 years) but first we have to go through a period of taking out obsolete boards, storing them, scrapping them for several rounds until we realize the true depth rate of PAX's in today's world is less than 10 years and could be less than 5 years.

****
****

Selected Lower Management Group Comments

NREI, standardization procedures and consumers will force company. Could be a real opportunity if AGT were to lead rather than follow.

I - Customer have the right to risk their own capital!
II - AGT cannot afford to finance 100% of telecommunications in Alberta.
III - The telecom trade has matured - many qualified people know how to furnish, install and maintain telephone and data besides AGT.

****
****

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APPENDIX C

NOTE:

The key elements of the presentation of each issue include:

1. Statement of research issue.
2. Statistical* overview of responses.
3. Highlights of qualitative responses.
4. Highlights of differences between groups.

* The results pertaining to the probability of occurrence are given as median values in percent. The results pertaining to the probable time of occurrence are given as the category(ies)# of responses representing the mode of responses. The values of the inter-quartile range of responses are given in percentage points.

#Legend
Category 1 - Zero to Five Years
Categroy 2 - Six to Ten Years
Category 3 - Eleven to Fifteen Years
Category 4 - Sixteen to Twenty Years
Category 5 - Twenty-one to Twenty Five Years
Category 6 - Never

1."THIRTY PERCENT (30%) OF THE CALGARY LOCAL EXCHANGE CABLE PLANT SHALL BE COMPOSED OF OPTICAL FIBRE CABLE."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	60.5 %	79.88%	50.0 %	59.75%
Probable Time of Occurrence	cat. 3	cat. 3	cat. 3	cat. 4
Inter-Quartile Range	74.8	39.75	50.33	39.8

The application of optical fibre technology in the telecommunications environment as a transmission medium has forced a very significant realignment of AGT management thinking in the area of future service planning and provisioning.

Upper management responses reflected a somewhat cautious but nevertheless optimistic attitiude. This hedging of forecasts pointed towards a lack of certainty and perhaps a lack of rigorous planning as to the exact nature and timing of the fibre optics program within AGT. Lower management group panelists cast doubt on the future existence of fibre optics within AGT in the time-frame and magnitude defined, as a result of the technologically driven nature of the fibre optics venture as a whole.

The key differences observed between the groups are outlined below:

i. Lower management group members highlighted a lack of rigorous strategic planning within AGT. In paticular, planning for technological innovation such as fibre optics was felt inadequate as evidenced from the overall set of commentary reviewed. Upper management group members did not share this view

ii. The lower management group seemed to suggest, on a number of occasions, that the upper management group did not have a market oriented view of the consuming environment.

2."AGT SHALL OFFER A CENTRALIZED INFORMATION RETRIEVAL SYSTEM (SIMILAR TO THE BRITISH "VIEWDATA" SYSTEM) AND ASSOCIATED SUBSCRIBER LOCATED EQUIPMENT TO SELECTED RESIDENTIAL CONSUMERS ON A COMMERCIAL BASIS."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	75.5 %	89.67%	49.88%	50.33%
Probable Time of Occurrence	cat. 2	cat. 2	cat. 2	cat. 3
Inter-Quartile Range	47.91	29.77	25.19	30.44

In discussing this departure from the traditional mode of telco operation, it was not entirely clear as to what the basic planning parameters for such an offering were to have been, especially in terms of dealing with competitive threats.

Upper management indicated a fairly positive disposition towards the centralized information retrieval system concept. However, some managers hedged their optimism based on the realization that "carrier" and "content" issues were uncertain and could markedly influence this service structure.

A major concern raised by lower management group members was whether AGT would in fact be availed the opportunity to participate or if the corporation would be relegated to a role consisting of information transmittal only. Factors causing concern appeared to have been the consumer adoption processes and the political / regulatory environment potentially impacting this service.

Major differences between the orientation of the groups included:

i. The lower management group voiced much more concern over the impact of competition on this service area, and appeared much less convinced of AGT's participation in this service provisioning area than did the upper management group.

ii. The lower management group appeared to view AGT's participation in this service offering as a carrier as opposed to the upper management group view.

iii. The lower management group intimated that the senior management of AGT was not capable of dealing with the described situation in an effective and efficient manner. The upper management group did not appear to have shared this sentiment.

3."A FULLY INTEGRATED VOICE-VIDEO-DATA LOCAL NETWORK FACILITY SHALL BECOME ECONOMICALLY FEASIBLE FOR AGT IN THE CALGARY AREA."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	74.83%	70.00%	50.33%	49.75%
Probable Time of Occurrence	cat. 2	cat. 2	cat. 3	cat. 4
Inter-Quartile Range	73.63	50.46	74.59	29.92

It was apparent that network integration offered many potential for AGT. However, competitive and regulatory forces were envisioned as undermining AGT efforts in this area.

Upper management responses indicated a fairly positive view of network integration. However questions as to the viability of the system arose based on the assumption that little benefit might accrue to the consumer.

Lower management views of the issue were founded mainly on a discussion of inhibiting factors capable of affecting the integration. It was clear that even though there was a general lack of confidence in the project as described, the basis for such was based upon a variety of concerns including governmental interference, regulation, competitive pressure and lack of management depth.

Summarily, it was determined that the upper management group saw a fairly bright future in store for the integrated network described. Conversely, lower management participants seemed to view the establishment of an integrated facility as being of somewhat questionable value to AGT in view of the competitive and political factors influencing this issue.

The major difference observed between the two groups included rested on the observation that the upper management group appeared to have qualified their positive view on a technological basis while the lower management group, generally discounted the technological parameters and choose to dwell on other intervening varibles.

4."THE CANADIAN POST OFFICE SHALL MARKET AN EXTENSIVE ELECTRONIC MAIL SERVICE TO THE CANADIAN BUSINESS COMMUNITY, POSSIBLY UTILIZING TCTS MEMBER COMPANY LONG-HAUL FACILITIES."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	50.17%	50.2 %	50.0 %	50.5 %
Probable Time of Occurrence	cat. 2	cat. 2	cat. 2	cat. 2
Inter-Quartile Range	50.13	20.83	49.87	40.0

The main issue which seemed to concern participants was the role which both the C.P.O. and telephone companies might be expected to play in the future provisioning of electronic mail service.

Upper management appeared to substantiate a positive position based on the necessity for an electronic mail service and the felt need of the telephone companies to participate in the provisioning of this service. However, it was not made entirely clear whether AGT and other TCTS member companies were veiwed as being service provisioners or merely carriers of the service for the C.P.O. or other service provisioner.

The lower management participants appeared to have been favorably disposed to the concept of electronic mail and the need for such. However, it was suggested that the C.P.O. would not be the provisioner of this service. Rationale for such appeared to center upon the perceived lack of organizational flexibility inherent to the troubled Government department. Accordingly, it was implied that the telephone companies would venture into the electronic mail service area.

The differences observed to have developed between the two groups are outlined below:

i. The upper management group appeared to pay much less attention to the competitive and political factors foreseen as impacting the electronic mail environment than did the lower management group.

ii. The lower management group exhibited less confidence in the abilities of either the C.P.O. or the TCTS group provisioning electronic mail service than did the upper management group.

5. "THE TRANS-CANADA TELEPHONE SYSTEM ORGANIZATION, AS A RESULT OF INCREASING SERVICE PROVISIONING ACTIVITY SHALL BECOME A LEGALLY INCORPORATED AND SUBSEQUENTLY REGULATED ENTITY."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	25.50%	30.1 %	25.50%	20.5 %
Probable Time of Occurrence	cat. 3	cat. 3	cat. 6	cat. 6
Inter-Quartile Range	25.55	15.0	75.13	30.45

The currently developing nature of TCTS business was viewed as being undesirable in the context of the Canadian telephone industry.

While several managers suggested the incorporation and subsequent regulation of TCTS as being potentially desirable, the majority of upper group managers opposed to this view. Rationale for this position was founded on two basic issues; an increasingly competitive telecommunications environment and the necessity for the simplification of the regulatory structure in Canada.

The overall position of lower management participants was fairly favorable toward the issue, suggesting that while the incorporation was viewed as being desirable, the possibility of such occurring was deemed as being slight. Perhaps the best summation was provided by a participant who suggested that incorporation was a prerequisite to effective management but contradictory to existing regulatory and political leanings.

Differences observed between the groups are outlined below:

i. Upper management comments suggested that the member companies' desire for autonomy would prevent the described event from occurring. Lower management placed very little emphasis upon such a position.

ii. The upper management participants indicated that all efforts towards centralization of control and regulation might prove to be detrimental to AGT while the lower management group suggested a strategy of centralization to be of at least marginal value in view of the increasingly competitive nature of the telecommunications environment in Canada.

6. "A CLEARLY IDENTIFIABLE SEPARATION OF COSTS AND REVENUES ATTRIBUTABLE TO EACH CORPORATE SERVICE ACTIVITY WITHIN AGT SHALL BE EFFECTED."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	99.63%	80.00%	74.9 %	70.5 %
Probable Time of Occurrence	cat. 2	cat. 3	cat. 2	cat. 2
Inter-Quartile Range	74.75	49.56	74.42	50.25

Discussion of the issues appeared to have centered upon two main factors; the definition of separation and the determination of the progress which was felt to have had already been made in the direction of attaining the described separation.

Lower management suggested an overwhelmingly positive disposition toward the concept of separation as outlined but it was not unanimously held that the separation would in fact be achieved. Several managers, though positively inclined, envisioned internal obstacles facing the attainment of the separation including internal politics, economics and inappropriate organizational structures within AGT. In summary, the lower management group indicated that knowing the costs and revenues for each service is not only good business practice but it makes management of the services, the company and its divisions possible.

The major differences whih were observed to have developed between the groups included:

i. The upper management group viewed public and regulatory pressures as the major forces contributing to the need to separate costs and revenues in the described manner. Lower management participants suggested that the necessity of the separation as a fundamental factor in effective management of AGT would be the driving force behind the separation.

ii. The upper management group suggested very strongly that the applicability of the described separation was valid only in the context of competitive service offerings while lower management saw a definite need for such in a broader scope of service areas.

iii. Lower management participants openly questioned the ability of mangement to accept and accomodate such while upper management group members didn't.

7."USAGE SENSITIVE PRICING (U.S.P.) SHALL BE IMPLEMENTED BY AGT FOR LOCAL EXCHANGE SERVICES TO HELP INCREASE THE REVENUE FLOW FROM LOCAL EXCHANGE PLANT FACILITIES."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	99.8 %	85.25%	75.42%	70.38%
Probable Time of Occurrence	cat. 2	cat. 3	cat. 2	cat. 2
Inter-Quartile Range	49.67	35.62	25.62	20.38

Overall, it appeared that U.S.P. (Usage Sensitive Pricing), although offering some very real benefits to AGT in the future, also presented some equally real difficulties relative to full scale implementation.

Upper management group participants indicated a generally favorable disposition toward the U.S.P. concept as there was felt to have been a need for equitability in the rating mechanism similar to that embodied in the U.S.P. concept. However, some managers envisioned consumer opposition to such in the forms of tradition and organizational inertia and it also appeared that political pressure would preclude the expedient adoption and implementation of U.S.P..

Lower management was divided on the issue. One group favored the concept based on the fairness and consumer requirement for such a rating scheme. The second group was opposed, suggesting that problems, both internal and external to AGT, would prevent a transition in the described direction.

The major differences which were noted to have developed between the groups included:

i. The upper management group indicated a much more pronounced need for the implementation of U.S.P. than did their lower management counterparts.

ii. The lower managment group appeared much more concerned with the potential difficulties associated with U.S.P. than did their upper management counterparts.

iii. The upper management group suggested the level of public acceptance of U.S.P. would be much greater than was the suggestion forwarded by lower management participants.

8."PROVINCIAL GOVERNMENT FINANCIAL SUBSIDIZATION SHALL BE REQUESTED BY AGT TO HELP EASE THE DEFICIT CREATED BY THE HIGH COST OF LOCAL EXCHANGE SERVICE PROVISIONING."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	24.83%	20.13%	50.25%	70.0 %
Probable Time of Occurrence	cat. 3	cat. 3	cat. 1	cat. 1
Inter-Quartile Range	40.21	30.12	89.75	69.55

The nature and extent of both direct and indirect financial subsidization became a contentious topic, and a very definite split in opinion was noted to have developed between groups.

First round upper management responses revealed that the opposition to the concept of subsidization was objectionable to a number of the participants. However, several managers viewed the requirement for Provincial Government subsidization of AGT activities as being inevitable based on the socially desirable aspects of low cost telephone service availability from the political perspective in the face of non-compensatrory rating practices.

Several lower management participants suggested that the subsidization described was not desirable in view of the vulnerable position AGT might place itself into. However, the vast majority of comments attempted to explain the degree to which financial subsidization was felt to exist and the rationale for such. The most precise overview of options facing AGT in the future relative the financial subsidization indicated that either the Provincial Government must subsidize local service or the customer must be made to pay.

Major differences between the groups included:

i. Upper management group members suggested that the described subsidization may occur as a result of external pressures brought to bear upon AGT. Lower management group members suggested that incompetent management had and would continue to necessitate the requirement for financial subsidization.

ii. Upper management group members suggested that AGT would rise to future challenges to its profitability thereby limiting the requirement for subsidization

9. "SATELLITE COMMUNICATION SYSTEMS SHALL ACCOUNT FOR ONE THIRD (1/3) OF ALL LONG-HAUL TRANSMISSION FACILITIES (CAPACITY) IN CANADA."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	74.63%	59.63%	50.33%	59.75%
Probable Time of Occurrence	cat. 4	cat. 3/4	cat. 3	cat. 3
Inter-Quartile Range	25.31	10.86	25.34	20.19

The advent of satellite communications capability has added a new medium to the telecommunications spectrum in this country and it has provided a relatively cost effective means of transmission technology to a host of carriers including the telephone companies.

The upper management group viewed the described penetration of satellite communication systems favorably and with anticipation. The improvements available to the telephone companies in terms of increased provisioning efficiency were key factors in the establishment of this position.

Though the lowwr management group was quite positively disposed toward the issue, competitive threats appeared to be of major concern to many of the participants.

The main differences which were discovered are outlined below:

i. The lower management group appeared much more aware and concerned with the competitive factors impacting the satellite services environment than did the upper management group.

ii. Upper management participants tended to view the technology and associated market potential for satellite services as being much more defined and stable than did the lower management group participants.

iii. The upper management group appeared to express less confidence in the overall desirability of satellite systems than did their lower management counterparts.

10. "REPRESENTATIVES OF CONSUMERS SHALL GAIN REPRESENTATION ON AGT'S E.O.C."

Based upon the nature of both the qualtitative and quantitative responses recieved, it appeared prudent to exclude this issue from further inclusion in the second round of the study questionnare. The issue did not seem to have been well received by the participants and it was felt that continued discussion of this issue may have impacted other facets of the study in a negative manner. As such, only one round of responses was analyzed and prepared for presentation.

11. "CN/CP TELECOMMUNICATIONS SHALL BE GRANTED FULL INTERCONNECTION CAPABILITY WITH TCTS MEMBER COMPANY LOCAL EXCHANGE FACILITIES."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	75.17%	80.00%	75.5 %	80.0 %
Probable Time of Occurrence	cat. 2	cat. 2	cat. 1	cat. 1/2
Inter-Quartile Range	49.63	30.5	49.67	25.0

The threat to the essence of the AGT operation was very familiar to most participants as were associated challenges to the existing managerial and planning expertise.

Upper management responses were characterized by a widespread acceptance of the interconnection concept as being limited or partial rather than full. It was also suggested that the concept may prove advantageous to AGT operations provided that AGT is prepared to charge suitably for the service.

Lower management participants suggested that interconnection was an inevitable state of future existence for the telephone companies including AGT. Primary factors influencing this trend were consumer demand and inappropriate strategic positioning on the part of telco management.

Inter-group differences are outlined below:

i. The lower management group appeared, on numerous occasions, to suggest many of the mitigating forces in the interconnection issue to be resident within telephone company management. The upper management group did not convey a similar notion.

ii. Much of the concern voiced by the upper management group appeared to centre on the qualification of the extent of the outlined interconnection. The lower management group tended to dwell much more extensively on the reasons and probable ramifications upon the telephone companies associated with the concept of interconnection as outlined.

iii. Upper management appeared to favor the defense of the telephone company monopoly position in the area of local and long-haul service provisioning than did their lower management counterparts.

12. "ZERO BASED BUDGETING SHALL BE EMPLOYED AS THE STANDARD BUDGETING PROCESS WITHIN AGT, REPLACING THE CURRENT BUDGETING PROCEDURES."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	75.10%	70.4 %	50.38%	49.67%
Probable Time of Occurrence	cat. 1	cat. 2	cat. 1	cat. 2
Inter-Quartile Range	49.55	20.5	50.06	30.5

Responses ranged from suggesting ZBB (Zero Based Budgeting) to be another managerial buzz word to those indicating this process to be mandatory if AGT ever has any hope of attaining an effective level of financial control within the operation.

Upper management suggested the inclusion of the ZBB concept as being mandatory to the establishment of an effective financial control system. However, it was implied that ZBB was appropriate for competitive service areas but not for application to basic service areas.

The necessity for ZBB was voiced by many lower management group participants. Others, though not discounting the potential worth of ZBB, envisioned obstacles in the path of its implementation within AGT from both internal and external sources, with managerial inability to cope with progress being cited as a primary factor. The greatest obstacle envisioned was felt to be the upper management of AGT.

The differences observed to have developed between the groups are outlined below:.

i. The upper management group envisioned the ZBB process described as being much more constrained in its applicability than did the lower management group.

ii. The lower management group saw the senior management of AGT as being a major roadblock to the implementation of ZBB while the upper management group members failed to share this sentiment.

iii. The lower management group envisioned a tremendous upheaval as being necessary within the basic managerial philosophy of AGT senior management as a prerequisite to successful implementation of ZBB. Upper management did not appear to share this position.

13. "OPEN PLANNING, PLANNING INVOLVING INTEREST GROUPS FROM OUTSIDE OF AGT, SHALL BE INITIATED TO IMPROVE AGT'S ABILITY TO RELATE TO THE CONSUMING PUBLIC."

From the comments and quantitative responses received, it became clear that this was not an issue suitable for further inclusion in the study. Certainly, management did not discount the requirement for consumer input, but rather, felt that the open planning scheme outlined was inappropriate. the issue was deleted from further inclusion in the study and only an overview of the first round responses was developed.

14. "TWENTY-FIVE PERCENT (25%) OF ALL CANADIAN LONG-HAUL TOLL TRAFFIC SHALL BE CARRIED BY ORGANIZATIONS OTHER THAN TCTS MEMBER COMPANIES OR THEIR AFFILIATES."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	74.70%	70.0 %	74.6 %	70.1 %
Probable Time of Occurrence	cat. 3	cat. 3	cat. 3	cat. 3
Inter-Quartile Range	25.52	29.82	24.87	29.67

The high level of profitability historically associated with long distance telephone communications coupled with a the emergence of a pro-competitive regulatory environment has made this service extremely vulnerable to competitive entry.

Upper management was defensive in its tone and appeared optimistic of AGT's ability to forestall the level of competitive penetration described. However, the majority of managers viewed the described interconnection as an inevitable intrusion upon telephone company business. In fact, it was suggested that the telephone companies would be very fortunate to retain 75% share of the described market.

Lower management commentary suggested the described degree of competition in the area of long-haul toll to be very likely. Rationale to this end included the maturing of the cable operators and the erosion of CRTC power. Further it was suggested that the type of long-haul affected would be mainly private networks as opposed to traditional message toll services. Key factors mitigating the trend were internal mismanagement and competitive strength.

Differences between the groups are outlined below:

i. The upper management group appeared to have favored the assumption of a reactive rather than proactive stance in dealing with the threat; the lower management group favored the converse.

ii. The lower management group appeared convinced that mismanagement of the telephone business to date played a major role in opening the doors to the entry of competitive forces. Upper management comments did not reflect a similar sentiment.

15. "AGT SHALL OFFER ALL SUBSCRIBER EQUIPMENT FOR OUTRIGHT PURCHASE, INCLUDING PABX AND KEY SYSTEMS, IN COMPETITION WITH PRIVATE SUPPLIERS IN THIS AREA."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	89.83%	95.25%	90.50%	90.0 %
Probable Time of Occurrence	cat. 3	cat. 3	cat. 3	cat. 4
Inter-Quartile Range	49.55	20.04	24.37	29.92

The described merchandising policy appeared to represent the probable future for AGT due to pressures from consumers and competitors.

Upper management favored two main positions. The first of these tended to dwell on the inevitability of outright sale while the second tended to examine AGT's ability to deal with the described occurrence. The key conclusion of the group appeared to suggest that AGT's present mode of operation did not lend itself well to implementation of the described concept.

Lower management tended to focus on the forces and factors, both controllable and uncontrollable, which were favoring the establishment of the outright sale mode of operation. These included antiquated pricing practices and an increasing propensity on the part of consumers to risk their own capital. Further, it was felt that the implementation of a well planned and managed program would be very beneficial to AGT but would most likely not occur due to the presence of a restrictive upper management team and other external forces.

The two major differences determined to have existed between the groups appear below:

i. Lower management perceived the senior management of AGT to have been a primary obstacle to the orderly and effective transition to the described mode of merchandising. Upper management felt appropriate policies were in place to this end and did not share a similar opinion.

ii. Upper management participants appeared to feel much less strongly about the described trend than did their lower management counterparts. Further to this point, the lower management group appeared to view this process as being much more important to the future of AGT than did the upper management group participants.

16. "THE BALANCE OF SYSTEM INTELLIGENCE SHALL SHIFT FROM THE NETWORK TO THE TERMINAL RESULTING IN GREATER REVENUES BEING GENERATED FROM THE TERMINAL AND SUBSCRIBER AREAS THAN FROM THE NETWORK"

	Statistical Summary			
	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	50.17%	50.38%	75.08%	79.75%
Probable Time of Occurrence	cat. 3	cat. 3	cat. 3	cat. 4
Inter-Quartile Range	50.25	20.69	49.9	19.87

Both management groups recognized the apparent significance of the outlined factor, however the nature, extent and possible ramifications of this phenomenon were not at all consistent across groups.

Upper management generally viewed the described shift as inevitable, but the timing and magnitude of such was not determined to be as great as indicated in statement of the issue. It appeared that this group favored the notion that control of system intelligence would continue to rest with the telephone company.

Lower management appeared to offer support to the suggestion outlined in the statement of the issue. Though rationale for the shift was described in terms of technological and competitive factors, it was also stated that increased intellegence at the terminal point would be beneficial to the end user and therefore be a key factor forcing the described degree of migration.

A summary of the differences observed appears below:

i. Upper management was much more concerned with the potential loss of network control resulting from the shift than were lower management group members.
ii. Lower management implied the current management philosophy within AGT to be a key difficulty in dealing with the described shift in an effective manner. Upper management participants did not appear to share this sentiment.

17. "ALL AGT SERVICE ACTIVITIES SHALL BE STRUCTURED AS PROFIT CENTRES FOR CONTROL PURPOSES."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	75.5 %	79.63%	50.17%	79.7 %
Probable Time of Occurrence	cat. 2	cat. 2	cat. 2	cat. 2
Inter-Quartile Range	74.8	30.9	50.71	30.4

This concept of responsibility structuring received much attention both in a positive and negative manner, indicating a lack of unity amongst the study participants relative this issue.

The upper management group appeared to have held a fairly positive overall view of the issue. However, the essence of many responses appeared to have suggested that the concept was applicable to competitive service control but not to basic service areas.

The lower management group was somewhat negatively positioned relative to the suggestion of a widespread application of the profit centre mode of responsibility structuring. The central thesis of the position did not question the validity of the concept itself, but rather the applicability of such in view of the tradition bound management and environmental factors not favoring this approach.

The differences observed to have developed between the groups included:

i. Lower management appeared more concerned with the prerequisites for implementation of the described responsibility structuring scheme than did upper management group members. Lower management group members appeared more concerned with the ramifications and impact of the described concept upon AGT than did the upper management group members.

ii. The lower management group perceived the upper management group as as being an inhibiting factor to the establishment of progressive and effective control systems within AGT. Upper management did not appear to share this sentiment.

18. "DUE TO THE INFLUENCE OF U.S. TELECOMMUNICATIONS POLICY UPON CANADA, THE SAME GENERAL SET OF CONDITIONS GOVERNING REGULATION AND COMPETITION WILL EXIST IN BOTH NATIONS."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	74.67%	69.71%	99.68%	75.50%
Probable Time of Occurrence	cat. 3	cat. 3	cat. 2	cat. 2/3
Inter-Quartile Range	75.25	50.05	49.75	15.38

The recent advent of multinational competitors coupled wih increasing consumer awareness and pressure also appeared to be of concern to participants.

Upper management did not favor the suggestion outlined. Two basic reasons cited were that the Canadian telecommunications environment would continue to differ structurally from that in the U.S. and that the political and regulatory dimensions were dissimilar in both nations, thereby precluding the existence of the same general set of regulatory and competitive conditions in both nations. It was however held that U.S. telecommunications policy has had and would continue to have a marked influence upon the Canadian telecommunications environment.

Lower management indicated that the economic and social ties between the nations necessarily contributed and would continue to contribute to the increasing similarity in telecommunications policy. It was made clear that the similarity would not be total, and that the impact would be cushioned by a time lag which would also serve as a filtration process, preventing total similarity from developing.

The key difference observed is outlined below:

i. The upper management group appeared to dwell more heavily on the structural differences between the telecommunications environments between the countries as forestalling the described phenomenon as compared to the lower managment group. Lower management took the position that the structure of the Canadian telecommunications industry was in the process of changing to mirror the U.S. industry to a great, but not total, extent. The upper management group did not appear to favor this view

while the lower management group members suggested that AGT had already failed in this effort.

iv. Upper management stated that AGT would cope with any financial shortcomings without turning to the Provincial Government for financial subsidization except in a desperate situation. Lower management opposed this view quite strongly.

19. "AS THE DISTINCTION BETWEEN BROADCAST AND TELECOMMUNICATION MODES OF SERVICE PROVISIONING BECOMES LESS APPARENT, AGT SHALL UNDERTAKE JOINT VENTURES WITH CATV COMPANIES TO PROVISION CURRENTLY UNREGULATED SERVICES (E.G. SHOP-AT-HOME, ALARM, ETC.)."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	74.70%	69.75%	25.17%	20.33%
Probable Time of Occurrence	cat. 2	cat. 2	cat. 2	cat. 6
Inter-Quartile Range	25.27	20.16	49.38	20.25

Although the CATV industry was felt to pose a very real threat to AGT, there appeared to have been some favor shown this suggestion, especially by members of the upper management group.

Upper management appeared to favor at least a certain degree of cooperation between AGT and the CATV industry. Technology and the high degree of commonality relative to the respective distribution systems were seen as positively influencing this trend. However, several managers doubted the desirability of the proposal, suggesting that neither of the participants would have much if anything to gain via entry into the described arrangement.

Lower management were negatively inclined toward the described cooperation. This view was furthered by suggestions that CATV companies would not require AGT participation in their ventures and that AGT was not suitably managed to allow for such a cooperative effort to take place.

Inter-group differences are outlined below:

i. The upper management group was opposed to the lower management group view which indicated little if any advantage to exist for either of the concerned parties in entering into the described arrangement.

ii. The upper management group appeared more concerned with technological or "hard" issues relative tothe issue than did the lower management group who tended to view the issue from a more general perspective.

iii. The lower management group viewed joint venturing with the CATV companies as a means of allowing these firms the opportunity for encroachment upon AGT service provisioning activities while upper management viewed such in exactly the opposite manner.

20. "AGT SHALL FILL A SIGNIFICANT PORTION (10% +) OF MID AND UPPER MANAGEMENT POSITIONS WITH PERSONNEL FROM OUTSIDE OF THE TELEPHONE INDUSTRY."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	50.0 %	50.14%	50.17%	50.17%
Probable Time of Occurrence	cat. 2	cat. 2	cat. 2	cat. 6
Inter-Quartile Range	49.63	10.57	50.38	20.33

The rapidly changing environment in which AGT was seen as operating coupled with increasingly rigorous demands being made of its management appeared to favor acceptance of the afore outlined suggestion by most participants.

Some upper management group members favored the idea while others, though not necessarily opposed to such, failed to see much value in this proposal. It was suggested that if this unlikely event were to occur, it would likely come as a result of outside pressure upon the organization to do so. A major factor in this regard was considered to have been the developing competition in the telecommunications arena.

Lower management generally favored the notion forwarded in the statement of the issue. However, they were somewhat less optimistic of attainment of the described level of penetration than upper management, indicating that the tradition-bound promotional practices currently in place would negatively impact the probability of this occurrence.

The differences between the groups relative this issue are outlined below:

i. The lower management group appeared to have been much more certain of the need for the described influx of outside management than did the upper management group.

ii. The lower management group appeared to dwell more heavily on the difficulties common to existing promotional practices than did upper management group memebers.

21. "CATV COMPANIES SHALL PROVIDE LOCAL TELEPHONE GRADE SERVICE FACILITIES WITHIN CERTAIN ALBERTA CENTRES, SERIOUSLY CHALLENGING THE MONOPOLY UPON WHICH THE CURRENT AGT CHARTER IS BASED."

Statistical Summary

	Upper Management		Lower Management	
	RI	RII	RI	RII
Probability of Occurrence	25.13%	29.67%	25.5 %	40.5 %
Probable Time of Occurrence	cat. 2/6	cat. 6	cat. 2/3	cat. 6
Inter-Quartile Range	25.31	19.82	50.28	40.0

Management generally seemed to have accepted the influence of the CATV industry upon the Alberta telecommunications environment, but did not view such as a serious threat to AGT.

Though upper management did not see the CATV companies directly encroaching on current AGT service offerings, they felt that the CATV compnies could effectively limit AGT's revenue growth potential in the future. It was also suggested by several mangers that the CATV companies might select to provide not only "enhanced" services, but also "basic" services.

Lower management generally viewed the CATV companies as only a minor threat to AGT, but conceded that these were a strong force in the Alberta telecommunications environment. CATV ability to limit AGT's revenue potential from "enhanced" services was considered a key threat. However it appeared that political support, AGT's current market position in the provisioning of telephone service and the economic barriers to entry would preclude any serious CATV threat from developing.

Several differences were observed to have been present between the groups:

i. The upper management group indicated that barriers to entry into the provisioning of telephone grade service would preclude this possibility. Lower management did not appear to share this sentiment.

ii. Upper management tended to view the issue as being primarily technological and economic in nature, while the lower management group tended to view it as regulatory/political issue.

iii. Upper management tended to view political forces as being sympathetic to AGT in this issue. Lower management was not as convinced of this.